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U. S. DEPARTMENT  
OF AGRICULTURE

# GRADUATE SCHOOL

## *Annual Catalog*

1953-1954



WASHINGTON, D. C.

## Calendar for 1953-54

### FALL SEMESTER

Sept. 12-19	Registration (Late fee charged after Sept. 19)
Sept. 21-25	Classes begin
Oct. 2	Last day of registration for credit
	Last day of course transfer without late fee
Oct. 16	Deferred payments due
Oct. 23	Deadline for credit-audit change
Nov. 11	Armistice Day—no classes
Nov. 26	Thanksgiving Day—no classes
Dec. 19-Jan. 3	Christmas holidays—no classes
Jan. 4	Classes resume
Jan. 22	Close of fall semester *

### SPRING SEMESTER

Jan. 30-Feb. 6	Registration (Late fee charged after Feb. 6)
Feb. 8-12	Classes begin
Feb. 19	Last day of registration for credit
	Last day of course transfer without late fee
Feb. 22	Washington's Birthday—no classes
Mar. 5	Deferred payments due
Mar. 12	Deadline for credit-audit change
May 28	Close of spring semester *

### SUMMER SESSION

June 7-12	Registration (Late fee charged after June 12)
June 14-18	Classes begin
June 18	Last day of registration for credit
	Last day of course transfer without late fee
June 25	Deferred payments due
July 5	Independence Day—no classes
July 9	Deadline for credit-audit change
August 20	Close of Summer Session *

\* Classes which have missed sessions for any reason will continue until the deficiency is made up.

### IMPORTANT

The provisions of this publication are not to be regarded as an irrevocable contract between the student and the United States Department of Agriculture Graduate School. The Graduate School reserves the right to change any provision or requirement at any time. The Graduate School further reserves the right at any time, to ask a student to withdraw when it considers such action to be in the best interests of the School.



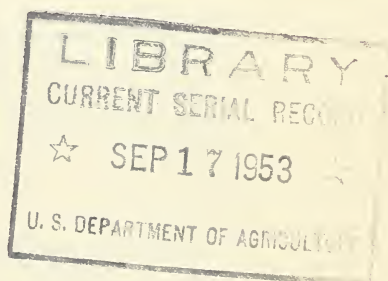
# GRADUATE SCHOOL

## UNITED STATES DEPARTMENT OF AGRICULTURE

# CATALOG

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FALL—SPRING—SUMMER  
1953—1954



*Please keep this catalog for use in  
the Spring and Summer.*

*This Catalog, published annually by the Graduate School, covers graduate and undergraduate programs for the Fall and Spring Semesters and the Summer Session. It is made as accurate as possible, but the right is reserved to make changes in details as circumstances require. A bulletin on correspondence study is available on request.*

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# *General Information*

## PURPOSE OF THE SCHOOL

Since its establishment in 1921, the objective of the Department of Agriculture Graduate School has been to improve the Federal Service by providing needed educational opportunities for Federal employees. The Graduate School now offers a resident instruction program in Washington and a small correspondence program. In addition, it presents lecture series, offers educational counseling, contributes to training programs in the Department of Agriculture, and participates in cooperative programs with land-grant and other educational institutions. Graduate study is the primary interest of the School but it also offers an undergraduate program. Graduate School classes are open to all qualified employees of the Federal Government and to other qualified persons as facilities permit.

## FOUNDING OF THE SCHOOL

The statute which established the Department of Agriculture in 1862 gave it the responsibility to "disseminate agricultural information in the broadest sense of the word." Thus from the beginning employees of the Department have been educators, and it soon became apparent that if they were to be successful they needed opportunities to continue their training while employed.

In 1898, Secretary of Agriculture Wilson expressed the need of the Department for an organization like the Graduate School, particularly to provide post-entry education for young scientists coming into the Department's research programs. No action, however, was taken at that time. Shortly after World War I, when the need for qualified personnel became acute throughout the government, the Congressional Joint Committee on the Reclassification of Salaries recommended that the government departments give more attention to the development of opportunities within the Federal Service for the continuing education of their employees. Accordingly, the Secretary of Agriculture appointed in 1920 a special committee to explore the matter. After considering the committee's findings and consulting leading educational institutions and other government agencies, the Secretary established the Graduate School in 1921 and announced at that time: "I believe those who may be able to avail themselves of this opportunity will both enrich themselves and enhance the value of the service they render."



## ACCREDITED STANDING

The Graduate School does not grant degrees and has never sought that authority. It prefers to give courses of standard graduate and undergraduate grade; to have the merits of these courses judged by the well-known competence of its instructors; and to cooperate with institutions which have the authority to grant degrees.

The United States Civil Service Commission accepts Graduate School credits, for examination and qualification purposes, on the same basis as those from accredited colleges and universities.

## ADMINISTRATION

The government of the Graduate School is vested in a General Administration Board appointed by the Secretary of Agriculture. The functions of this Board correspond in general to those of boards of trustees of universities. The School is administered by a director and a small administrative staff. It is a nonprofit institution and receives no Federal funds.

The evening program in Washington is organized into eight departments. Each department is directed by a departmental committee composed of an appointed chairman and others of recognized competence in the respective fields. These committees are responsible for organizing and giving general administrative direction to the programs and activities of the departments. Within the departments, depending on the scope and specialization of the programs are divisional committees. The eight department chairmen and the Director make up the Graduate School Council. Similar committees direct other Graduate School programs.

## TEACHING AND RESEARCH RESOURCES

The Graduate School recruits its staff from scholars in the Federal Service. Many of the faculty members, in addition to government service, have taught in the colleges and universities throughout the country.

The Graduate School student body enjoys the use of the noted library and laboratory facilities of Washington. In addition to a large library in the Department of Agriculture, containing more than a half a million volumes on both agricultural and non-agricultural subjects, students have ready access to the rich storehouses of the Library of Congress, the Smithsonian Institution, and the National Archives. Supplementing the Department Library as necessary is a collection of books supplied directly by the Graduate School.

### PUBLIC LECTURES AND SEMINARS

Lecture series on current problems give Department employees and others an opportunity to hear authorities discuss current problems in agriculture and in other national and world affairs. Lectures which are especially relevant to the needs and interests of Department employees are given during official working hours. Registration is not required and no fees are charged.

### COOPERATION WITH THE UNIVERSITY OF MARYLAND

To provide broader educational opportunities for those served by each institution, the Graduate School of the United States Department of Agriculture and the University of Maryland have made a cooperative arrangement under which certain resources of each institution are made available to students of both institutions. Representatives of certain subject matter departments at each institution are engaged in organizing integrated educational programs.

Under these arrangements, work taken at the Graduate School of the United States Department of Agriculture may be applied as partial residence credit toward undergraduate or advanced degrees at the University of Maryland. Those wishing to take advantage of this arrangement must work out an approved program of study in consultation with appropriate officials at the University of Maryland. This should be done at a point as early as possible in their programs.

Graduate School students wishing to take advantage of these opportunities may secure instructions from the Registrar.

### COOPERATION WITH BOSTON UNIVERSITY

The Graduate School in 1952 assisted Boston University in organizing a program of special evening courses for Federal employees in the Boston metropolitan area. An announcement of this program is available.

### COOPERATIVE INTERNSHIP PROGRAM WITH LAND-GRANT INSTITUTIONS

Post-graduate and post-doctorate personnel in Land-Grant Colleges and Universities are afforded opportunities for research and for gaining other desirable experience under this program developed jointly by a committee from the Graduate Council of the Association of Land-Grant Colleges and Universities and the Graduate School. This work is under the direction of the Department of Agriculture professional staff in Washington, the Agricultural Research Center and elsewhere. Specific arrangements under this

program are between personnel from these educational institutions and agencies in the Department. Details may be had from the Office of Personnel or the Graduate School.

#### CERTIFIED STATEMENTS OF ACCOMPLISHMENT

Certified Statements of Accomplishment are offered in the fields of Accounting, Administrative Procedures, Agricultural Economics, Meteorology, Public Administration, and Statistics upon the student's completion of specified programs of study. Each student interested in earning a Certified Statement of Accomplishment in any of these fields should receive approval, from the Registrar, of his proposed program of study. For complete details see the outlined program in the Department concerned.

These statements are offered to encourage the student to complete a well-organized program in his chosen field of study or work. Each student who receives a certified statement also is given an informational transcript of his completed program which he may use as a public record of qualification. At the student's request, an official transcript is sent to an institution or agency designated by him.

#### SCHOLARSHIPS FOR FEDERAL ADMINISTRATIVE INTERNS

Each semester the Graduate School grants a limited number of scholarships, in the form of free tuition for one course, to persons who are participating in an official internship training program in one of the agencies of the Federal Government. Applications for these scholarships should be made by letter to the Registrar through an appropriate official in the agency in which the intern is training.

#### GRADUATE SCHOOL PUBLICATIONS

Publications of the Graduate School include:

1. A general annual *Catalog* which contains detailed information about the resident educational program in Washington, D. C.
2. Time Schedule and Supplement, published each semester—fall, spring and summer—which carries added details about the resident educational program in Washington.
3. Books and periodicals, published at irregular intervals containing: original contributions by faculty members; special lectures devoted to the advancement of the arts and sciences; and significant manuscripts prepared by employees of the Department of Agriculture, which the Department has been unable to publish. A partial list of these publications is given on the outside back cover of this *Catalog*.



## CORRESPONDENCE PROGRAM

The small correspondence program of the Graduate School is designed primarily for the field employees of the Department of Agriculture, although the courses are open to others as the facilities permit. There are many other courses not offered by the Graduate School which are of interest to Department employees and are available through the correspondence programs of the colleges and universities throughout the country. The Graduate School is happy to assist a student to find courses in which he is interested.

The courses offered by the Graduate School are listed on page 107 of this *Catalog*. Students who wish more information about any of the courses or who wish to register in one of the courses may write to the Registrar, U. S. Department of Agriculture Graduate School, Washington 25, D. C.

# *Regulations and Procedures*

## ADMISSION

Admission to resident courses in the Graduate School is open to all qualified employees of the Federal Government, and to other qualified persons as facilities permit.

## ENTRANCE REQUIREMENTS

Since the Graduate School does not offer degree programs, entrance requirements differ with the level of the course for which the student is registering.

Undergraduate courses, in general, are open to persons who are graduates of a standard high school or equivalent or who qualify for the course because of satisfactory work experience. For admission to more advanced courses college work in the same or related field is specified or understood. For other courses definite prerequisites may be stated. Year courses require the completion of the work of the first semester or its equivalent.

## VETERANS

Graduate School courses are available to veterans under the provisions of Public Laws 346 and 16 as amended, and Public Law 550. Registration for part-time study is charged against educational benefits only in the proportion that the number of semester hours bears to a full normal load.

Veterans who are re-entering Graduate School classes after an interruption of training or who are entering the Graduate School for the first time are advised to consult the Registrar of the Graduate School sufficiently in advance of registration that a program may be determined and the necessary arrangements made with the Veterans Administration.

## COUNSELING SERVICES

Officers of the Graduate School are available, throughout the registration periods and from 9:00 a.m. to 5:00 p.m. each day for counseling on educational plans, whether courses are to be pursued in the Graduate School or in other institutions. In addition, where necessary, arrangements are made to refer persons having special problems to authorities in the particular field of work or study.

### TRANSFER OF CREDIT

Careful planning is important for any prospective student, but particularly so for the Federal employee who wishes to make a substantial beginning in his educational program through the Graduate School, where degrees are not granted and credits must eventually be transferred to a degree-conferring institution. A student cannot assume that credit for work done at the Graduate School will be accepted by any particular college or university. Universities generally accept transfers of credit on the basis of the individual courses taken, the student's over-all program, and the quality of the work done by the student.

The student who wishes to take an advanced degree should consult in advance the dean of the graduate school of the institution where he expects to become a candidate for his degree to secure approval for whatever portion of his program the institution of his choice will accept from the Graduate School. The student who is deficient in basic undergraduate courses needed as a foundation for his graduate program will find many of them available in the large undergraduate program of the Graduate School. Others may be found in local universities.

A student who is planning work toward an undergraduate degree should consult in advance the dean of the institution from which he expects to receive the degree if he wishes credit toward the degree for work taken at the Graduate School.

### REGISTRATION

The registration period for each semester is shown on the School calendar on the inside front cover. A late fee per course is charged for registration after the opening of the semester. After the second week of classes in the fall and spring semesters, and after the first week in the summer session, students may register for credit only with the approval of the instructor and the Registrar. Registration is not completed until the required fees have been paid.

### COURSE LOAD

Students employed full time may carry more than two courses only with the permission of the Registrar.

### FEES

*Course Fees.* In general, fees are computed at \$10.00 per semester hour credit.

*Late Fees.* There is a \$2.00 per course late registration fee and a \$1.00 per course late transfer fee as shown in the School Calendar.

*Reinstatement Fee.* Students who fail to meet payments when due are charged a reinstatement fee of \$2.00 per course in addition to all accrued fees.

*Laboratory Fee.* Laboratory or materials fees are listed in the Schedule of Classes for each semester, in connection with the courses for which they are charged.

*Service Fee.* A fee of \$1.00 per course is charged each student using the deferred payment plan.

*Transcript Fee.* There is a 50¢ fee for each copy of a student's record on the regular Graduate School form or on the form of another institution or state board of education.

#### PAYMENT OF FEES

Fees are due and payable in advance at the time of registration. Registration is not complete and no student is permitted to attend classes until all fees have been paid.

In exceptional cases, an arrangement may be made at the time of registration for payment of fees in two installments, one half plus a service fee at the time of registration, and the balance by the end of the fourth week in the fall and spring semesters, and by the end of the second week in the summer session.

A student who fails to meet payments when due will be suspended and may not attend classes until he has been reinstated and has paid all accrued fees as well as a reinstatement fee of \$2.00 per course.

All fees are payable at the Graduate School business office, Room 1031, South Building, United States Department of Agriculture.

#### ATTENDANCE AT CLASSES

Students are expected to attend all class sessions and not to absent themselves without adequate reason.

Absences do not relieve the student from responsibility for work required while he was absent, and the burden of proof that the work was done rests with the student. In courses in which the work cannot be satisfactorily tested by written examination, the instructor shall be the judge of the relation of the student's attendance or non-attendance to his grade. A student registered for credit in an undergraduate course who is absent more than 25% of the class periods receives a mark of "W," withdrawn, unless he makes up all required work. Auditors who are absent more than 25% of the class periods receive the mark of "W."

## CREDIT AND GRADES

*Academic Credit.* Persons registering for academic credit must satisfy all prerequisites for admission to the course as generally stated or specified in the course description.

*Audit.* An auditor must meet the same prerequisites as a credit student. He receives full privileges of class participation if he chooses to exercise them. An auditor does not receive a grade; he receives only a mark of AUD.

*Change from Audit to Credit.* A student may change his registration from audit to credit, or vice versa, within thirty days after the beginning of the semester in the fall and spring, and within three weeks after the beginning of the summer session. The request for change must be made in writing to the Graduate School. Special forms are available at the School office.

*Grades.* At the close of the semester students receive written notice by mail of grades received. The following letter grades are used:

A	Excellent
B	Good
C	Fair
D	Passable
F	Failure
Aud	Auditor
Inc	Incomplete
W	Withdrawn

## TRANSCRIPT OF CREDIT

*Inclusion in Personnel Record for Department of Agriculture Employees.* To aid in effecting its promotion-from-within policy, the Department has provided (USDA Administrative Regulations, Title 8, Chapter 42, paragraphs 1548-1551, dated 10-13-48) that a record of Graduate School credits earned by its employees will be placed in official personnel files of the agency. Unless specifically requested by the employee that such action not be taken, the Graduate School will forward, upon completion of the courses or at the end of the year, a copy of the student's record, without cost to the employee, to the personnel officer of the administration, bureau or office in which the student is employed.

*Certification on Request.* Upon a student's written request and the payment of the transcript fee, an informational record will be sent to him, or an official transcript or informational record to an agency or institution designated by him. An official transcript will be sent only when the student has filed with the Graduate School a transcript of his previous academic work showing that he has met



all requirements for admission to the level of the courses for which he registered.

#### WITHDRAWAL AND REFUNDS

Application for withdrawal from Graduate School classes must be made in writing to the Registrar. A form for this purpose is available in the Graduate School Office. *Reporting the dropping of a course to an instructor does not constitute an official withdrawal.* Permission to withdraw will not be given to a student who does not have a clear financial record.

Refund of tuition fees only will be granted in cases of official withdrawal according to the following schedule:

<i>Fall and Spring Semesters</i>	<i>Refund</i>
During first and second weeks of term	Tuition less \$5.00 per course registration fee.
During third and fourth weeks of term	60% of tuition (a minimum of \$5.00 per course will not be refunded).
During fifth and sixth weeks of term	40% of tuition.
<i>Summer Session</i>	
During first week of session	Tuition less \$5.00 per course registration fee.
During second week of session	60% of tuition (a minimum of \$5.00 per course will not be refunded).
During third week of session	40% of tuition.

*Refunds will be computed as of the date the application for withdrawal is received in the Graduate School Office.* In no case will tuition be reduced or refunded because of non-attendance in classes. No refund will be made of laboratory or other incidental fees.

Since commitments for instruction and other arrangements are necessarily made in the beginning of the semester, no refunds for any reason can be made except in accordance with the above schedule.

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The Graduate School reserves the right to cancel any course if registration does not warrant continuance; to discontinue, postpone or combine classes; to change instructors; to change classroom assignments; to make any changes deemed advisable in registration and in fees; and to require the withdrawal of any student at any time for such reasons as the School deems sufficient.

*Courses of Instruction*

Courses given during the academic year 1953-54 are listed on the following pages by departments of instruction. The departments are listed alphabetically.

The words Fall, Spring and Summer indicate the semester in which the course is offered. The number of credits indicates the value of the course in semester hours. Bracketed numbers indicate courses which will not be given in 1953-54.

Courses numbered 1-100 are non-credit; 100-399, undergraduate; 400-699, advanced undergraduate (senior) and graduate; above 699, graduate only.

# Biological Sciences

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DANIEL L. LEEDY  
ALBERT H. MOSEMAN  
BYRON OLSON

RAYMUND L. ZWEMER

—O—

Scientific efforts have been greatly intensified in recent years with the result that research discoveries have a direct bearing on the activities of every individual and organization. Many government workers in fields only indirectly related to biology often need an understanding of basic principles in the biological sciences to do a competent job in their own fields. On the other hand, government workers in the biological sciences are continually faced with the problem of keeping abreast of the rapid advances in the application of these principles and new gains in basic knowledge.

The Department of Biological Sciences has arranged a series of courses to meet the needs of each of these groups. Unless laboratory work is specified, the courses are non-laboratory. The advanced courses are taught as seminars. All of the courses are taught by outstanding specialists from Federal and other research institutions.

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### [1-300.] **Fundamentals of Entomology** (1954-55 and alternate years)

Spring, 3 credits

REECE I. SAILER

### **1-310. The History of Biology**

Year, 2 credits each semester

MORRIS C. LEIKIND

A lecture and discussion course on the historical foundations of modern biology. During the first semester the origins of the biological sciences from antiquity through the seventeenth century are considered. During the second semester topics discussed are the rise of the experimental method and the history of special problems such as the cell theory, evolution, heredity, and the germ theory of disease. The development of biology in the United States with special reference to the U. S. Department of Agriculture, the Smithsonian Institution and other Government agencies are studied. *Prerequisite:* One year of biological sciences or consent of the instructor.

### [1-512.] **Medical and Veterinary Entomology** (1954-55 and alternate years)

Year, 2 credits each semester

F. C. BISHOPP



**1-518. New Developments in Insecticides**

Fall, 2 credits (alternate years) F. C. BISHOPP, H. L. HALLER and SPECIALISTS

Discussion by specialists in this field which has advanced rapidly during and since World War II. The chemistry of insecticides, their manufacture, pharmacology, attention to the relation of pesticides to public health including hazards from residues and careless handling. Usefulness of insecticides in protecting man, clothing, buildings, houses, livestock, gardens, fruit, field crops, forests, and stored products from insect attack. Practical problems involved in the use of various insecticides and fumigants. Review of recent applicable literature. *Prerequisite:* Basic courses in biology and chemistry or consent of instructor.

**1-570. Design of Experiments in Biological Sciences**

Year, 2 credits each semester (alternate years) D. D. MASON and SPECIALISTS

Principles of experimental design as applied to planning and analysis of plant and animal experiments. Problems in determining size of experiments, and selection of appropriate designs to meet objectives. Randomized block, latin squares, split plot, and incomplete block designs; their characteristics, uses, and analysis will be considered. Experimental and sampling errors, components of error, factorial arrangements, confounding, use of individual degrees of freedom and regression in analysis of variance will be studied in lecture and assigned problems. *Prerequisite:* A course in experimental statistics or familiarity with meaning and method of calculation of standard errors, correlation, regression and analysis of variance.

**[1-603.] Advances in Plant Breeding and Genetics (1954–55 and every third year)**

Fall, 2 credits MARTIN G. WEISS and SPECIALISTS

**1-608. Advances in Human and Animal Nutrition**

Spring, 2 credits (alternate years) PAUL E. HOWE and SPECIALISTS

A seminar on nutrition of man and animals, specifically and comparatively. The effect of variations in the development of animals and plants on nutritive value and changes resulting from processing. The reactions of man to food as it influences the nutrition of man. *Prerequisite:* Basic training in nutrition or consent of instructor.

**[1-609.] Recent Developments in Plant Physiology (1954–55 and alternate years)**

Fall, 2 credits MARION W. PARKER and SPECIALISTS

**[1-620.] Recent Advances in Weed Control (1954–55 and alternate years)**

Spring, 2 credits WARREN C. SHAW, R. L. LOVVORN and SPECIALISTS

**1-625. Trematoda**

Year, 2 credits each semester GEORGE R. LA RUE

Morphology, life history and systematics of Trematoda with special emphasis upon the Digenetica. Lectures, laboratory work, demonstrations, and discussions. The course will be based on Ben Dawe's: *The Trematoda*. *Prerequisite:* Two years of zoology.

**1-702. Radioisotopes and High Energy Radiation in Biology**

Spring, 2 credits (every third year) STERLING B. HENDRICKS and SPECIALISTS

Principles involved in the production and measurement of high energy radiation and radioisotopes will be discussed as a background for application to biology. Applications will deal with the effects of radiation on living systems, and use of isotopic tracers in study of biochemical mechanism and plant nutrition. Guest lecturers will discuss special topics. *Prerequisite:* Professional training in biology, chemistry or physics.

# Languages and Literature

## DEPARTMENTAL COMMITTEE

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GEORGE E. BEAUCHAMP

J. P. BLICKENSBERGER

ERWIN JAFFE

KENNETH W. OLSON

LESTER A. SCHLUP

RALPH R. SHAW

FRANKLIN THACKREY (Vice-chairman)

R. LYLE WEBSTER

## IMPORTANCE OF ENGLISH, WRITING AND SPEECH

Among students preparing for technical careers and among busy people employed on the basis of their technical competence, there is an inevitable tendency to concentrate on subject-matter specialties. Technical knowledge is of no value, however, unless it can be communicated to others. It is common knowledge in the Government service and in industry that nothing so much retards the progress of many young technicians, scientists, and other professional personnel as their inability to write and speak effectively.

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## ENGLISH—GRAMMAR AND WRITING

### 2-85. Creative Writing

Summer, non-credit

SMITH DAWLESS

FRANCES H. MILLER

Lectures on types of fiction and the study of techniques. Analysis of short stories. Writing of short stories or simpler forms of narration. *Prerequisite:* One year of college English or the equivalent.

### 2-118. Practical English Usage

Fall, 2 credits. Repeated in Spring and Summer

VERNE L. SAMSON

KAY B. WEBER

This course enables students through practice to master the fundamentals of correct English. Troublesome problems of English usage, sentence structure, choice of words, style, and grammar, are studied as aids to clear and forceful writing of letters, memoranda, and reports.

### 2-119. Vocabulary Building

Fall, 2 credits. Repeated in Spring and Summer

CHARLES D. MURPHY

Study of the sources and origins of words in order to gain insight into their present meanings. Principles of word formation; dictionary study and exercises in word selection. The course stresses the most common Latin and Greek roots used in forming English words.

### 2-222. English Composition

Year, 3 credits each semester

FRANCES H. MILLER

KATHRYN P. WARD

KAY B. WEBER

Equivalent of freshman English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to

more advanced English studies. Special attention given to the fundamental principles and mechanics of good writing—grammar, punctuation, spelling, diction, etc. Exercises in writing short and long themes and in studying, analyzing, and evaluating selected English prose texts.

## 2-223. Descriptive English Grammar

Fall, 2 credits. Repeated in Spring and Summer

SUSAN E. HARMAN

A course in the study of grammatical principles, stressing sentence structure and correct English form. Lectures on the history and development of inflectional and derivational forms. Exercises in diagramming and in analyzing examples of good and bad English.

## 2-224. Readable Writing

Fall, 2 credits

AMY G. COWING

Teaches you how to write so that more people will read and understand your articles and bulletins; how to estimate how easy or hard the reader will find your writing; how to organize your writing for easy reading. Deals briefly with the use of pictures and other visual aids to reading. Much of the course centers around use of the Flesch Readability Formula and consists of lectures and workshop sessions in which students make practical application of writing principles. *Prerequisite:* College freshman English or equivalent course in composition.

## 2-226. Introduction to Official Writing

Fall, 2 credits

J. KENDALL McCLARREN and VIRGINIA G. TATUM

This course covers the principles of clear statement which must be applied to all forms of writing. Emphasis is given to the special requirements of official writing in economic and scientific research, government organization, and policy. The course considers ways of making official writing clear, vigorous, and readable in spite of the necessary rules and restrictions. It is designed for people who are not professional writers but whose work calls for some copy preparation. One major writing project is required. *Prerequisite:* College freshman English or the equivalent in writing experience.

## 2-227. Workshop in Official Writing

Spring, 2 credits

J. KENDALL McCLARREN and VIRGINIA G. TATUM

This course is a continuation of Introduction to Official Writing. The informal workshop approach is designed to meet the individual needs of students whose work requires some writing. Writing principles developed in the previous course are applied to reports, scripts, releases, and other media. *Prerequisite:* Introduction to Official Writing or its equivalent.

## 2-230. Playwriting

Fall, 2 credits

TERRENCE W. McCABE

A study of the techniques of playwriting: plot, structure, characterization, problems of the dramatist. Lectures and discussions. Analysis of prescribed plays.

## 2-231. Playwriting Workshop

Spring, 2 credits

TERRENCE W. McCABE

An active participating class for those who have written or are writing plays. Study and analysis of playwriting techniques. Student plays will be read in class by actors and criticized by the class. Plays meriting public showing will be considered by the Agriculture Players for production.

**2-235. Fiction Writing**

Fall, 2 credits

SHERWOOD KING

Stresses such fiction fundamentals as plotting, characterization, dialogue, story organization, testing readability and interest, and increasing dramatic quality of writing. Emphasizes writing techniques which increase salability of student manuscripts by discussing editorial taboos, ways to obtain salable story ideas, and methods of marketing manuscripts. *Prerequisite:* English Composition or equivalent, or permission of instructor.

**2-242. Fiction Writing Workshop**

Spring, 2 credits

SMITH DAWLESS

Discussion, criticism and suggestions for revising student manuscripts. Emphasizes methods of slanting for particular markets, discussions of what editors buy and why, and ways to polish manuscripts to increase sales possibilities. *Prerequisite:* Fiction Writing or equivalent.

**2-280. Feature Writing**

Fall, 2 credits

DUNCAN N. SCOTT

Stresses how to find article ideas, how to do the research necessary to develop them into salable articles, best methods of presentation of material, ways to polish writing to make it more salable, ways to determine magazine needs, how to slant material for particular magazines, and how to test readability and interest of writing. *Prerequisite:* English Composition or equivalent, or permission of instructor.

**2-281. Feature Writing Workshop**

Spring, 2 credits

DUNCAN N. SCOTT

Discussion, criticism and suggestions for revising student manuscripts. Emphasizes methods of slanting for particular markets, discussions of what editors buy and why, and ways to polish manuscripts to increase sales possibilities. *Prerequisite:* Feature Writing or equivalent.

**2-450. Workshop in Technical Writing**

Year, 2 credits each semester

MARGUERITE GILSTRAP and MAURICE FRIED

A course designed to help scientists and economists improve their research reports and articles for professional publications. The first 3 weeks are devoted to a survey of the fundamentals of writing the scientific report: its characteristics, parts, functions, the steps in preparation, the process of criticism. The remainder of the term is spent in the preparation, criticism, and revisions of reports and articles—written for official use when possible. *Prerequisite:* Undergraduate degree in one of the sciences, engineering, economics, or similar technical field.

## ENGLISH LITERATURE

**2-330. Great Books I**

Year, 2 credits each semester \*

M. CLARE RUPPERT

Group discussion, under leadership, of important works in poetry, history, philosophy and criticism. The leader will try to help with the reading and understanding, but the books themselves will be the teachers. The intention of the course is to give insight into perennial, and therefore contemporary, problems, not historical and literary information. The only qualifications required are an interest in ideas and belief in free discussion. With few exceptions the books will be read in their entirety. One, two, or three meetings will be given to a book depending upon its length. Discussion will center around the following authors:



Fall Semester: Bible, *Book of Job*; Homer, *Odyssey*; Sophocles, *Oedipus Rex*, *Antigone*; Plutarch, *Lives: Alexander and Caesar*; Plato, *Apology* and *Crito*; Plato, *Republic*, books 4-6; Aristotle, *Politics*, *Ethics*; Marcus Aurelius, *Meditations*; St. Augustine, *Confessions*; St. Thomas Aquinas, *On the Law*.

Spring Semester: Bible, *Gospel of St. John*; Dante, *Divine Comedy*; Machiavelli, *the Prince*; Montaigne, *Selected Essays*; Shakespeare, *King Lear*, *Hamlet*; Rousseau, *Social Contract*; *Federalist Papers*; Goethe, *Faust*; Marx, *Communist Manifesto*; Veblen, *Theory of Leisure Class*; Adams, *Education of Henry Adams*.

\* Students may attend both semesters or either semester.

## 2-332. Great Books II

Year, 2 credits each semester

JOHN T. CHENEY

Group discussion, under leadership, of works of the authors listed. While the leader will endeavor to help with the reading and understanding, the books themselves may be considered the teachers. The intention is to give insight into perennial, and therefore contemporary, problems, not historical and literary information. The central theme of the Fall semester is the relationship of fact and information; of the Spring term, individual freedom and responsibility to society. Qualifications required are an interest in ideas, and belief in free discussion; it is in addition urged that the students have completed Great Books I. Authors to be read include:

Fall Semester: Thucydides, *History of the Peloponnesian War*; Aristophanes, *Lysistrata*; Aeschylus, *Agamemnon*; Euripides, *Medea*; Hobbes, *Leviathan*; Plato, *Phaedo*; Milton, *Areopagitica*; Aristotle, *Poetics*; Plato, *Symposium*; Cervantes, *Don Quixote*.

Spring Semester: Kant, *Fundamental Principles*; Ibsen, *Master Builder*, *Wild Duck*, *Ghosts*; Xenophon, *Persian Expedition*; Lucretius, *On the Nature of Things*; Tawney, *Religion and the Rise of Capitalism*; Sophocles, *Oedipus at Colonus*.

## INFORMATION AND LIBRARY METHODS

### 2-75. Introduction to Library Techniques

Year, non-credit

JOSEPH T. POPECKI

Emphasis on methods and techniques used in processing the books in libraries: order and accession records, cataloging and classification records, circulation records, shelf list, filing inter-library loan records, introduction to general reference books. Actual work with books, records and filing.

### 2-126. Medical Terminology

Year, 2 credits each semester

LOUISE BOLLO

Designed to familiarize medical secretaries, librarians, diagnosis coders, statisticians, and other workers in various health programs, with the sources and meanings of the hundreds of disease entities encountered in hospital records, death certificates, causes of disability, etc. Such a course would be especially helpful to health workers, social workers, and other persons interested in the tabulation and measurement of disease but who have not had a formal medical education.

### 2-220. Indexing

Fall, 1 credit

MABEL H. DOYLE

This course is intended primarily for those interested in making indexes for periodicals, bulletins, reports, and books. Emphasis will be placed on general procedures and matters of policy as well as on basic principles and techniques.

Specific types of indexing adapted to various subjects and popular style, contrasted with technical and scientific styles, will be studied. Examples of different kinds of indexes will be shown and opportunity given for practical work in the preparation of indexes, including the making of cross references, alphabetizing, and editorial preparation of index cards and manuscripts for the printer. *Prerequisite:* A knowledge of library or editorial work is desirable.

## 2-225. Principles of Editing and Their Application

Fall, 3 credits

ROY E. MILLER and GENIANA R. EDWARDS

Intended primarily for those seeking information on editorial techniques involved in handling manuscripts after they leave the author's hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; word forms, sentence structure and effective use of English; the Style Manual of the Government Printing Office; considerations governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; the relation of type to subject matter and the techniques of printing; and the fundamentals of indexing and proofreading. Opportunity is afforded to apply these principles in practical work in editing, which is then discussed in class. A trip to the Government Printing Office is arranged to note and study operations there.

## 2-237. Government Printing Procedure

Spring, 2 credits

LOUIS H. ANDERSON

Intended for those who plan, prepare, or procure printing, duplicating, and distribution of books, pamphlets, folders, posters, charts, forms and other printed or duplicated matter. Subjects covered include: analysis of manuscript copy and its purpose to determine format and method of production; organization of copy for effectiveness; copy fitting and measuring; ways to aid the reader to grasp the message of the printed word; legibility and readability; type faces and typography; illustrations; printing and duplicating processes and criteria for their use; paper; binding methods; preparation of copy for duplicator and printer; handling of proofs; specifications and cost factors; and channels and methods of distribution of Government publications. The knowledge of methods and procedures to be acquired from this course is intended to give the student competence and confidence in dealing with author and editor, and printing, duplicating and distribution technicians.

## 2-240. Audio-Visual Aids in Information and Education

Fall, 2 credits

SEERLEY REID and R. LYLE WEBSTER

A survey of the many ways audio-visual aids can be used in training, employee relations, and information and education programs. Covers not only newer materials such as motion pictures, filmstrips, and recordings, but also modern uses of photographs, charts, graphs, maps, and the like—even the art of using a blackboard. Gives practical suggestions on the most effective use of these aids for different purposes—developing physical skills, imparting information, changing attitudes, and otherwise influencing human behavior. Lectures and demonstrations with guest speakers presenting material on special topics. Each student will have the opportunity to choose his own problem for intensive study.

## 2-360. Advanced Practice in Editing

Spring, 2 credits

GENIANA R. EDWARDS and SPECIALISTS

Advanced instruction in literary and statistical editing and handling of graphic materials. Students will edit a practice manuscript requiring reorganiza-

tion, extensive editing, and uniform styling. Several Government agency styles for citation, tables, graphics, and other details will be compared, and adaptation of style meeting special requirements yet conforming to Government Printing Office rules will be studied. Administrative procedures for work on pamphlets, magazines, etc., will be outlined. *Prerequisite:* Principles of Editing and Their Application, or consent of instructor.

## SPEECH

### 2-228. Fundamentals of Speech

Fall, 2 credits. Repeated in Summer

VIRGINIA B. ROSER

Through the preparation and delivery of short original speeches the student gains poise, assurance, and the ability to express himself clearly and accurately. Strict adherence to time limit quickens mental processes and develops discrimination in the selection of speech material. Voice, articulation, and pronunciation drills. Posture, movement, and gesture. Learn to speak by speaking at each class meeting. Constructive criticism.

### 2-229. Public Speaking

Spring, 2 credits

GEORGE E. BEAUCHAMP

Students enrolling for this course should have had Fundamentals of Speech or some speech-making experience. Emphasis is placed on determining what one's purpose is in speaking, and accomplishing that purpose effectively. How to be interesting and clear, how to develop and support ideas, and how to handle discussion. Each student speaks and receives personal speech suggestions at each class meeting.

### 2-232. Voice and Remedial Speech

Fall, 2 credits. Repeated in Summer

WALTER B. EMERY  
L. POE LEGGETTE

Study and intensive drills in voice production, flexibility, range, articulation, and enunciation. Training and practice are designed to improve vocal conditions for all speech purposes and to remedy minor speech difficulties. In order that students may receive more individual attention, registration is limited to twenty.

### 2-234. Correction of Speech Dialect

Spring, 2 credits

WALTER B. EMERY  
L. POE LEGGETTE

Designed for persons having local or foreign dialect wishing to acquire standard American pronunciation and speed; intensive phonetic studies and drills to help the student hear properly and produce correctly American speech sounds and to avoid deviations therefrom; special reading and speaking exercises to improve diction and conversational ability; training is designed to serve individual needs.

### 2-350. Conference Methods and Procedures

Spring, 2 credits

GEORGE E. BEAUCHAMP

For persons who take part in formal or informal meetings either as chairmen, leaders, or participants. How to develop and work within an effective agenda, stimulate profitable discussions and arrive at worthwhile and equitable conclusions. How to develop and express one's point of view effectively in discussion.

**2-355. Parliamentary Procedure**

Fall, 2 credits

GEORGE E. BEAUCHAMP

Principles and practices of parliamentary procedure. Designed for persons who work with organizations which use these principles in the conduct of meetings.

**2-400. Persuasive Speaking**

Fall, 2 credits

GEORGE E. BEAUCHAMP

Intended for persons who have had one or both of the courses, 2-228 and 2-229, or their equivalent in speaking experience. Special attention is given to outlining and organizing speech materials, to developing interesting speech style, and to studying the techniques of influencing people's belief and behavior. Among the topics studied are emotion, rationalization, stereotypes, prejudice, and the will-to-believe.

**FOREIGN LANGUAGES**

The Graduate School provides opportunities for instruction in a wide range of foreign languages. The person who is seeking the maximum practical value from a foreign language must learn not only to translate it but to think in it well enough for translation to be unnecessary. It is the aim of those responsible for these courses to conduct them so as to develop in their students a ready and intelligent use of the language.

**FRENCH****2-253. Elementary French**

Year, 3 credits each semester

JACK C. ARNOULD  
HENRI DE MARNE  
MARGUERITE ETIENNE

Provides basic knowledge of French grammar and vocabulary. Reading, translation, dictation, and some conversation. The teaching of the proper pronunciation is stressed. For beginners.

**2-254. Intermediate French**

Year, 3 credits each semester

JACK C. ARNOULD

Systematic review of French grammar. Writing of French composition, reading, translation, dictation, conversation. For students who have had one year of college French, or two or three years of average grammatical preparation below college level.

**2-255. French Conversation**

Year, 2 credits each semester

MARGUERITE ETIENNE

Designed to develop in students a fluent style of idiomatic conversation on topics most likely to be met in travelling in French speaking countries. Grammar review only if deemed necessary. Some composition and dictation exercises. Reading of current French newspapers and magazines. *Prerequisite:* Two years of college French or the equivalent; a good knowledge of grammar and a sizeable vocabulary.



## 2-40. Everyday French

Spring, non-credit. Repeated in Summer

JACK C. ARNOULD

For students who have had one year or more of French who wish to improve their French reading and conversation. Less emphasis on grammar than in Intermediate French. Slight review of grammar. Reading, translation, dictation, and conversation.

## GERMAN

## 2-259. Elementary German

Year, 3 credits each semester

MARIANNE LEDERER  
JOSEPH PONTI

Essentials of German grammar. Reading and writing simple prose. Introduction to extensive reading. Some conversation. Training in the fundamentals required to go on to Intermediate German.

## 2-260. Intermediate German

Year, 3 credits each semester

MARIANNE LEDERER

Grammar review. More extensive reading and vocabulary building to provide an adequate foundation for understanding German texts and carrying on conversation. *Prerequisite:* One year of college German, or two or three years of average grammatical preparation below college level.

## 2-261. German Conversation

Year, 2 credits each semester

MAGNA E. BAUER

Development of facility in discussion and reading, use of idioms, writing and thinking in the language. *Prerequisite:* Two years of college German, or the equivalent.

## 2-41. Everyday German

Fall, non-credit. Repeated in Spring and Summer

MAGNA E. BAUER  
JOSEPH PONTI

Accuracy and facility in the use of oral German through listening to spoken German, reading, word analysis, and particularly repetition of the "basic thousand words" in round-table conversation. Work will be adapted to the members of the class. The beginner will have a chance to acquire a working vocabulary; the more advanced student will have an opportunity to practice the correct use of words, phrases, and idiomatic expressions. For beginners in the language as well as those who have had one year or more of German.

## ITALIAN

## 2-270. Elementary Italian

Year, 3 credits each semester

JOSEPH PONTI

Essentials of Italian grammar. Reading and writing simple prose. Introduction to extensive reading, some conversation.

## 2-271. Intermediate Italian

Year, 3 credits each semester

JOSEPH PONTI

Grammar review. Extensive reading and vocabulary building to provide an adequate foundation for understanding Italian texts and carrying on conversation. *Prerequisite:* One year of college Italian, or two or three years of average grammatical preparation below the college level.

## PORTUGUESE

**2-290. Elementary Portuguese**

Year, 3 credits each semester

JACOB ORNSTEIN

Basic grammar and vocabulary. Reading, translation, conversation. For beginners.

**2-291. Intermediate Portuguese**

Year, 3 credits each semester

JACOB ORNSTEIN

Grammar review. Writing of Portuguese composition, more extensive reading, translation, and conversation. *Prerequisite:* One year of Portuguese.

## RUSSIAN

**2-295. Elementary Russian**

Year, 4 credits each semester

GEORGE M. KORENEV ROCKWELL  
EUGENIA TARAKUS

Designed to give the student a sound foundation in basic Russian. Includes reading, writing, and speaking of Russian. Special attention is given to the fundamental rules of Russian grammar, Russian phonetics, and the mechanics of good reading and writing. The first semester covers the first 18 lessons of the textbook, "Bondar's Simplified Russian Method, Seventh Edition," and the second semester covers the second 18 lessons. Students should have a good knowledge of English grammar.

**2-296. Intermediate Russian**

Year, 3 credits each semester

GEORGE M. SAHAROV

Reading and translation, grammatical analysis, dictation and conversation in Russian. *Prerequisite:* One year of Russian which included the completion of a basic grammar text, Bondar or the equivalent.

**2-297. Conversational Russian**

Year, 3 credits each semester

GEORGE M. SAHAROV

This course is alternated with Advanced Russian, depending upon student demand. For students who have had at least two years of Russian language training.

**2-299. Advanced Russian**

Year, 3 credits each semester

GEORGE M. SAHAROV

Reading and translation of more advanced Russian texts, composition in Russian, oral and written translation from English to Russian. Conversation. *Prerequisite:* Two years of Russian.

**2-45. Review of Elementary Russian**

Summer, non-credit

GEORGE M. SAHAROV

General review of Russian grammar, accompanied with oral and written exercises. *Prerequisite:* A year course in elementary Russian, or the equivalent as approved by instructor.

**2-46. Everyday Russian**

Summer, non-credit

GEORGE M. SAHAROV

Accuracy and facility in the use of oral Russian through the use of dictation, conversation and other devices. *Prerequisite:* One year of Russian.

SPANISH

**2-300. Elementary Spanish**

Year, 3 credits each semester

ERWIN JAFFE

MARJORIE C. JOHNSTON

Foundation work in grammar, vocabulary, reading, and translation.

**2-301. Intermediate Spanish**

Year, 3 credits each semester

FERNANDO R. ROMERO

Grammar review, more difficult reading and translation, use of idioms, writing and discussion in the language. *Prerequisite:* One year of Spanish at college level, or two or three years below college level.

**2-302. Spanish Composition and Conversation**

Year, 2 credits each semester

G. MEDRANO DE SUPERVIA

Thorough training in the structure of the language, through reading and discussion of Spanish newspapers, magazines and novels of today. Writing of compositions, commercial and familiar letters; helping student acquire ability to speak and understand everyday and colloquial Spanish. *Prerequisite:* Intermediate Spanish or equivalent.

**2-574. Advanced Spanish Conversation and Literature**

Year, 2 credits each semester

RAFAEL SUPERVIA

Especially adapted for those having a fair knowledge of the Spanish language, who want to improve it by the readings of and comments on the masters of Spanish literature. *Prerequisite:* Ability to read, understand, and express oneself clearly in Spanish.

**2-47. Everyday Spanish**

Spring, non-credit. Repeated in Summer

ODILON PONCE

Accuracy and facility in the use of oral Spanish will be attempted through the use of dictation, conversation, and other devices. The work will be adapted to those entering the course. The course is designed especially for those who wish to acquire fluency in the spoken language of today. *Prerequisite:* One year of Spanish.

# Mathematics and Statistics

## DEPARTMENTAL COMMITTEE

W. EDWARDS DEMING (Chairman)

JOSEPH F. DALY

HAROLD F. DORN

MURRAY A. GEISLER

MARGARET J. HAGOOD

MORRIS H. HANSEN

EARL E. HOUSEMAN

B. R. STAUBER (Vice-chairman)

## THE STATISTICIAN AND HIS EDUCATION

Unprecedented dependence is being placed on statisticians by administrative officials in government and private business all over the world. The statistician, through his specialized training, is able to provide current and comprehensive information on many subjects, and to do so with speed and economy. His specialized techniques are indispensable in industry.

The making of a statistician is a long and exacting process—several years of graduate study, plus at least a year and a half of high-grade experience under competent leadership. Educational facilities are strained, not only because of the heavy and increasing demand but also because the educational requirements placed on the statistician today are of an entirely different order of magnitude than they were a few years ago.

The courses described on the following pages accordingly provide training not only in theoretical principles, but training also in the administrative and research uses of data, as well as in the collection and processing of data and in the development and supervision of the minor skills necessary for carrying out statistical work.

In the design of a survey the statistician is concerned with the reliability and the cost of the figures that are to be obtained. Reliability is affected by many sources of error, which can be classified under two groups: (a) biases that are common to both complete counts and samples; (b) sampling errors. A thorough understanding of both types of error is essential in the work of the statistician. The statistical courses listed on the following pages deal mainly but not entirely with sampling errors. Proficiency in one or another branch of subject-matter such as sociology, economics, agricultural science, engineering, or some other specialized field, is essential for a full appreciation of the first type of error and for that reason collateral studies in one or more fields of science are advised and in fact are insisted upon in work leading to a Certified Statement of Accomplishment in Statistics.



## INTERNSHIPS IN SAMPLING

## COMMITTEE

W. EDWARDS DEMING (Chairman)

WILLIAM G. COCHRAN

MORRIS H. HANSEN

STERLING R. NEWELL

S. MCKEE ROSEN

IRVING SIEGEL

FREDERICK F. STEPHAN

ARYNESS JOY WICKENS

In recognition of the need for statisticians with thorough theoretical training and with experience in large-scale statistical projects under competent leadership, and in recognition of the exceptional facilities in Washington for specialized training in this field, the Graduate School has undertaken to present to qualified students the opportunity to pursue their studies under a system of internships. Under this program a limited number of qualified persons have a unique opportunity to combine advanced study with practical experience in sampling.

*Internship Program*

The internships provide opportunity for research work under leading authorities. The program is planned on an individual basis, depending on the experience, training and interests of the candidate. The internships are intended to supplement, not supplant, work offered in universities.

The following agencies have cooperated in the program:

Bureau of Agricultural Economics

Bureau of the Budget

National Bureau of Standards

Bureau of the Census

Bureau of Labor Statistics

National Institutes of Health

National Office of Vital Statistics

The internship consists of two integrated parts:

- (1) classroom training in courses at the Graduate School or at other educational institutions in the city;
- (2) work experience in government agencies on large-scale statistical sampling and testing programs.

*Length:* Twelve or eighteen months; the length of time spent in the internship is determined by the training and experience of the applicant.

*Qualifications:* Doctorate (a) in mathematical statistics, or (b) in a field such as agriculture, business, economics, social psychology, engineering. By arrangement, an intern may combine his internship with work on a doctoral thesis.

### *Selection*

Each application is reviewed and approved or rejected by the Committee on Internships in Sampling. The Committee helps the intern plan his program and consults with him from time to time concerning his progress. Where the intern program is being developed as a research project, serving as a basis for a doctoral dissertation, the Committee keeps the university informed of progress.

### *Stipends*

The internships carry no stipends. The Graduate School makes and offers no living arrangements.

### *Fees*

The only fees charged are nominal course fees for those courses in which the intern is registered.

### *Application*

Address the application to the Director, Graduate School, Department of Agriculture, Washington 25, D. C., and include the following information:

- |   |   |
|---|---|
| (1) Name  | (5) Fields of specific interest and                           |
| (2) Date and place of birth                                 | circumstances surrounding                                     |
| (3) Transcripts of previous academic work                   | application (i.e., purpose,                                   |
| (4) Citations or copies of publications or technical papers | whether applicant would devote full time to internship, etc.) |

Applications should be submitted well in advance of the beginning of the fall semester in September to insure adequate arrangement of work schedules and course programs.

### CERTIFIED STATEMENT OF ACCOMPLISHMENT IN STATISTICS

A Certified Statement of Accomplishment is offered in each of three fields of statistical study—fields representing areas of statistical preparation and application most useful in the public service. The required program in each field is outlined on page 31. The student who holds a bachelor's degree and who completes the basic courses and earns 24 credits in specialized courses listed in any column, with substitutions only as specifically approved, is eligible to receive a Certified Statement of Accomplishment. It certifies that the student has completed a program of study which, in conjunction with collateral training in a subject-matter field of application, prepares him for effective public service in a particular statistical field.

# COURSES LEADING TO CERTIFIED STATEMENTS OF ACCOMPLISHMENT IN STATISTICS

(With Concentration in One of the Following Fields of Application)

## THE SOCIAL SCIENCES

## THE NATURAL SCIENCES

## MATHEMATICAL STATISTICS

### BASIC COURSES—Required of all candidates

College Algebra, Plane Trigonometry and Analytic Geometry  
Principles of Statistical Analysis

College Algebra, Plane Trigonometry and Analytic Geometry  
Calculus  
Principles of Statistical Analysis

### SPECIALIZED COURSES

3-206. Calculus  
3-400. Introduction to Mathematical Statistics  
3-435. Sampling in Social and Economic Surveys  
3-436. Questionnaire Construction and Interviewing  
3-437. Market and Opinion Research  
3-448. Population Statistics I  
3-449. Population Statistics II  
3-520. Government Statistics  
3-708. Linear Algebra  
3-735. Theory of Sample Surveys

3-206. Calculus  
3-400. Introduction to Mathematical Statistics  
3-405. Introduction to Experimental Statistics  
3-507. Statistical Methods in Engineering and Industrial Production  
3-535. Statistical Techniques in Biometry and Medicine  
5-571. Design and Interpretation of Experiments in Physical Sciences  
1-570. Design of Experiments in Biological Sciences

3-400. Introduction to Mathematical Statistics  
3-500. Advanced Calculus  
3-708. Linear Algebra  
3-710. Applications of Linear Regression  
3-712. Theory of Functions  
3-735. Theory of Sample Surveys  
3-751. Theory of Measure  
3-752. Advanced Theory of Probability

### ELECTIVE COURSES

3-420. History of Mathematics  
3-500. Advanced Calculus  
3-502. Differential Equations

3-712. Theory of Functions  
3-752. Advanced Theory of Probability

## MATHEMATICS

### 3-1. Review of Freshman Mathematics

Spring, non-credit

SIDNEY KAPLAN

A review course on the level of freshman mathematics. Algebra, trigonometry, analytic geometry. A brief introduction to the methods of the differential calculus. Emphasis on applications to statistical problems. *Prerequisite:* One year of college mathematics.

### 3-2. Review of Calculus

Summer, non-credit

SIDNEY KAPLAN

Variables, functions, limits, divided differences, derivatives, application of derivatives to geometry, engineering curve fitting and analysis. Transcendental functions, polar equations, differentials, mean value theorem, techniques of integration and engineering application. Series and expansion of functions. *Prerequisite:* Calculus.

### 3-102. College Algebra

Fall, 4 credits. Repeated in Summer

JOSEPH S. RHODES

Fundamental rules of algebra; exponents; logarithms; manipulations with proportions; identities and conditions; solution of equations; binomial theorem; numerical approximations. Uses of symbolic operators. Determinants; solution of equations by the reciprocal matrix. Theory of equations; progression; series. Permutations and combinations. Graphical methods. Emphasis on applications to statistics and the physical sciences. *Prerequisite:* High school algebra and plane and solid geometry.

### 3-103. Trigonometry and Analytic Geometry

Spring, 4 credits

JOSEPH S. RHODES

Basic definitions and uses of trigonometric functions; logarithmic solutions; radian measure; fundamental identities; oblique triangles; polar coordinates, inverse trigonometric functions; complex numbers and De Moivre's theorem; graphs of the functions and the inverse functions; introduction to spherical trigonometry.

Fundamental concepts and formulas; line, circle, parabola, ellipse, hyperbola; transformation of coordinates; polar coordinates; parametric equations; the second and higher degree equation in rectangular coordinates; graphic solution of equations; introduction to solid analytic geometry. *Prerequisite:* College algebra.

### 3-206. Calculus

Year, 4 credits each semester

JOSEPH H. KUSNER

First semester: Variables, functions, limits, continuity, derivatives. Applications of the derivative to geometry and physics. Maxima and minima. Differentials. Mean value theorem. Simple integration and applications to geometry and physics. Radius and circle of curvature. Vectors.

Second semester: Standard integral forms. Special methods of integration. Approximate integration. Improper integrals. Indeterminate forms. Taylor's formula with remainder. Infinite series. Partial derivatives. Multiple integrals. *Prerequisite:* Algebra, trigonometry and analytic geometry.



### 3-345. Higher Algebra

Fall, 3 credits (alternate years)

SIDNEY KAPLAN

Review of permutations and combinations. Mathematical induction. Binomial theorem for any index. Multinomial theorem. Inequalities. Review of logarithms. Exponential and logarithmic series. Elementary theory of limits. Elementary theory of finite series. Partial fractions. Summation of recurring series. Elementary theory of numbers. Cramer's rule and Aitken's method of pivotal condensation. Doolittle technique. Elementary complex numbers. De-Moivre's theorem. Elementary theory of equations. Cubic, quartic, Newton's method. *Prerequisite:* College algebra and trigonometry.

### [3-416.] Elementary Theory of Equations (1954-55 and alternate years)

Fall, 3 credits

SIDNEY KAPLAN

### 3-420. History of Mathematics

Year, 3 credits each semester \* (alternate years)

DANIEL M. DRIBIN

The history of mathematics and the development of mathematical thought. First semester: Mathematics from earliest times to the end of the seventeenth century.

Second semester: Mathematics from the time of Newton and Leibniz. Various mathematical theories will be surveyed, including the nature of modern mathematics. *Prerequisite:* Calculus.

\* Students may attend both semesters or either semester.

### [3-430.] Unified Mathematics (1954-55 and every third year)

Year, 3 credits each semester

MURRAY A. GEISLER

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The following three courses form a three-year cycle.

### [3-425.] The Fundamental Concepts of Mathematics from an Advanced Standpoint (1955-56 and every third year)

Year, 2 credits each semester

JOSEPH H. KUSNER

### 3-500. Advanced Calculus

Year, 2 credits each semester (every third year)

JOSEPH H. KUSNER

Review of fundamental theory of the calculus, Taylor's series and related subjects. Plane curves, envelopes, order of contact. Differentiation and integration of integrals; line, surface and volume integrals. Infinite and improper integrals. Some calculus of variations. Asymptotic series and approximations to definite integrals in functions with several variables. Function scales and relations between derivatives. Reduction of curves to linear relations. Surfaces, tangent planes, and normals. Some study in the complex variable. *Prerequisite:* Calculus.

### [3-712.] Theory of Functions (1954-55 and every third year)

Year, 2 credits each semester

JOSEPH H. KUSNER

—O—

**[3-502.] Differential Equations** (1955-56 and every third year)

Year, 2 credits each semester

OTIS E. LANCASTER

STATISTICS

*Elementary Courses*

**3-126. Introductory Statistics**

Year, 2 credits each semester. Repeated in Spring and Summer

HOWARD EDELSON  
C. M. PURVES  
OTTO RAUCHSCHWALBE

The collection of data. The presentation of data in tables and charts. Different kinds of averages. Dispersion. Introduction to index numbers. Relations between two or more variables. Introduction to correlation theory, regression, and interpretation of samples. Practice in calculations. *Prerequisite:* High school algebra and geometry.

**3-136. Graphic Methods of Presenting Statistics**

Fall, 2 credits. Repeated in Spring

R. G. HAINSWORTH

Analysis of statistical data to determine what form is best for graphic presentation. Application of data to the many types of illustrations in several forms of the various classes. Rough pencil layout examples of time series charts, frequency diagrams, graphic correlation charts, pictorial symbol charts, cartograms and other illustrative examples will be prepared in class. Comparability and evaluation of individual charts and maps in a series will be analyzed. *Prerequisite:* An introductory course in statistics, Elements of Statistical Drafting, or experience approved by the instructor.

**3-318. Elementary Machine Tabulation**

Fall, 2 credits. Repeated in Spring

MILTON KAUFMAN

Designed principally for statisticians, accountants, and operators of punch card tabulating equipment. The instruction covers the principles of operation, functions, applications, limitations, etc. of the various types of IBM equipment such as card punching and verifying machines (including types 24 and 26), sorters, alphabetic accounting machine (type 405), reproducing punches and other auxiliary machines. *The course covers instruction in the basic wiring of the machines.* More than half the course is spent on the alphabetic accounting machine (type 405). Instruction also deals with the principal Remington-Rand punch card tabulating equipment. The course is not intended to train personnel in the physical operation of the various machines.

**3-319. Advanced Machine Tabulation**

Fall, 2 credits. Repeated in Spring

MILTON KAUFMAN

Designed principally for statisticians, accountants, operators and supervisors of punch card tabulating equipment. The instruction covers the principles of operation and functions of the IBM accounting machines, types 402 and 407 and the collating machines, types 77 and 89. *The course covers instruction in the wiring of the machines including the solution of advanced wiring problems.* *Prerequisite:* Elementary Machine Tabulation or knowledge of the basic wiring of tabulating equipment.

### 3-380. Principles of Statistical Analysis

Year, 3 credits each semester

B. RALPH STAUBER

The purpose of the course is to lay a thorough foundation of the basic concepts and principles of statistical analysis as a method of scientific investigation.

Specifically, the course includes statistical terminology; elementary probability; the binomial, Poisson, and normal distributions; statistical tests of significance; simple and multiple correlation; some theory of determinants with applications to correlation and the inverse matrix; introduction to analysis of variance; introduction to sampling; elementary principles of design and analysis of surveys and experiments; use of statistical tables such as Fisher, Yates, and others. *Prerequisite:* A working knowledge of college algebra, plane trigonometry, and analytic geometry; an elementary course in statistics is desirable.

### *Advanced Courses*

### 3-400. Introduction to Mathematical Statistics

Year, 3 credits each semester

JOSEPH F. DALY

A foundation course. A broad introduction to modern mathematical statistics, as preparation for further work in mathematical statistics for an advanced degree, or for a certified statement of accomplishment. Estimation: bias, consistency, efficiency. Testing statistical hypotheses. Solution of problems. Powers of various statistical tests. Use of moment generating functions to solve distribution problems. Methods of solution when the underlying distribution is unknown. Design of experiments and of sample surveys. *Prerequisite:* Calculus and Principles of Statistical Analysis or equivalent.

### 3-405. Introduction to Experimental Statistics

Year, 2 credits each semester

WALTER A. HENDRICKS

A non-mathematical course in the analysis and interpretation of data from agricultural and biological experiments. Elementary probability relationships; binomial, Poisson, and normal frequency distributions; the concept of sampling error; tests of significance of differences between averages; the chi-square test as applied to differences between observed and expected frequencies; regression and correlation; and elementary discussions of analysis of variance and covariance. Numerical examples. Text: Snedecor, Statistical Methods. *Prerequisite:* College training in agriculture or a biological science; familiarity with ordinary methods of tabulating experimental data, computation of averages and the preparation of graphs.

### 3-412. Statistics for Engineers

Year, 2 credits each semester

OTIS E. LANCASTER

A course designed to give engineers the basic theory necessary to understand statistical quality control and acceptance sampling used in industry; design of experiments; isolation of errors; analysis of data; including estimation of parameters and tests of significance; and the occurrence and importance of extreme values. *Prerequisite:* Calculus.

### 3-708. Linear Algebra

Fall, 3 credits (alternate years)

JOSEPH F. DALY

Determinants. Theory of linear dependence. Linear equations, homogeneous and nonhomogeneous. Matrix algebra; calculation of the inverse matrix; application to linear equations. Linear transformations. Quadratic forms; the matrix and discriminant. Reduction of a quadratic form to a sum of squares. The characteristic equation; definite and indefinite forms. Pairs of quadratic

forms, reduction to normal form. Properties of polynomials. Invariants, co-variants, half-invariants, and annihilators. Canonical formation of binary cubicals and quadratics. Symmetric functions. Elementary divisors. *Prerequisite:* Calculus.

**[3-710.] Application of Linear Regression** (1954-55 and every third year)

Spring, 3 credits

JOSEPH F. DALY

**3-735. Theory of Sample Surveys**

Year, 2 credits each semester

JOSEPH STEINBERG

History of sampling in social surveys. The use of statistical control in improving the quality and efficiency of the estimates. Calculation of sampling errors. Random, stratified random, purposive, double and systematic sampling. Cost function, choice of sampling unit; size and type of sample necessary to attain a stated degree of precision, and the distinction between precision and accuracy. The theory of probability is developed as necessary. The contributions of Fisher, Neyman, Yates, Cochran, and others are studied. *Prerequisite:* Principles of Statistical Analysis and Calculus.

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The following four courses form a three-year cycle.

**[3-430.] Unified Mathematics**

(See p. 33)

**[3-748.] Introduction to Mathematical Analysis** (1955-56 and every third year)

Fall, 3 credits

MURRAY A. GEISLER

**[3-751.] Theory of Measure** (1955-56 and every third year)

Spring, 3 credits

MURRAY A. GEISLER

**3-752. Advanced Theory of Probability**

Year, 3 credits each semester (every third year)

MURRAY A. GEISLER

Permutations, arrangements, and combinations; conditional probability; compound probability; repeated trials; Bayes' formula; simple Markoff chains; problem of runs; partial difference equations; Bernoulli's theorem; games of chance; law of large numbers; Markoff and Khintchine theorems; probabilities in continuum; Stieltjes integral; fundamental limit theorems; probability and statistical distributions; limit theorems for sums of independent vectors; method of moments and its applications; Tschebycheff's inequalities. *Prerequisite:* Calculus.

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*Applied Courses*

**3-025. The Federal Statistical System—Seminar**

Fall, non-credit

WALTER F. RYAN

The Federal statistical system: its growth, organization, major characteristics and functions. Review and critical analysis of the "Hoover Commission" Task Force Report on the Statistical Agencies of the Federal Government.

A series of four lecture-seminars meeting at 3:30-5:00 P.M. on October 7, October 21, November 4 and November 18. No registration required; no fees charged.



**3-435. Sampling in Social and Economic Surveys**

Year, 3 credits each semester

HAROLD NISSELSON

Non-mathematical survey of sampling theory and practice. Development of the basic ideas of statistical sampling, with applications in social and economic surveys. Unrestricted random, stratified, systematic, area and cluster sampling, and subsampling. Sample designs used in the United States and in foreign countries are discussed with respect to considerations of statistical efficiency, cost functions, and the administrative limitations imposed on the design. *Prerequisite:* A course in elementary statistics.

**3-436. Questionnaire Construction and Interviewing**

Fall, 2 credits

HYMAN GOLDSTEIN

Techniques for data collection in sample and census surveys; defining the issues; constructing the dummy tables; the pretest; question types; probes; scaling methods; projective techniques; depth interviewing; the focussed interview; interviewing practices; training interviewers; refusals; interviewer competence. *Prerequisite:* Principles of statistical analysis, or equivalent, and a background in the social sciences.

**3-437. Market and Opinion Research**

Spring, 2 credits

HYMAN GOLDSTEIN

Types of commercial and government research agencies; structure of the problem; uses of secondary factual data; defining the universe; factors influencing consumer behavior; questionnaire construction; techniques of consumer research; analysis of results; factors in influencing advertising effectiveness; measurement of advertising effectiveness; media. *Prerequisite:* Principles of statistical analysis or equivalent, and a background in the social sciences.

**3-480. Statistical Methods and Experimental Design**

Fall, 12 credits. Repeated in Spring AUSTIN A. HASEL and JAMES G. OSBORNE

Application of statistical methods to research work in the Forest Service stressing the logic of experimentation and the techniques of design, analysis, and interpretation of experiments or surveys. Emphasis is placed on: testing hypotheses in forest research; distribution of sample statistics; tests of significance.

Registration limited to qualified research personnel of the Forest Service.

**3-448. Population Statistics I: Basic Sources and Methods**

Fall, 3 credits

JACOB S. SIEGEL

Basic sources of population data in the United States. History of collection and quality of data. Basic methods of measuring and analyzing population size, geographic distribution, composition (age, sex, race) and population dynamics (natality, mortality, reproductivity, and migration). The decennial census. Basic demographic rates, including crude and refined rates. General methods (standardization, cohort analysis, interpolation, and graphics). Nature and use of life tables. Introduction to population estimates and forecasts. *Prerequisite:* An elementary course in statistics and one or more courses in the social sciences.

### 3-449. Population Statistics II: Intermediate Methods and Applications

Spring, 3 credits

MARGARET JARMAN HAGOOD

Statistics I, with more advanced techniques and specialized topics. Marriage and Divorce. Population Composition (marital status, educational status, economic characteristics, etc.). Family statistics. Advanced analysis of mortality, natality, reproductivity, and migration; measures based on life tables. Construction of life tables. Population estimates and projections, including specialized types (families, labor force, school enrollment). Analysis of population composition and dynamics in relation to other factors. Practical applications of methods in social and economic research, market research, and government planning. *Prerequisite:* Population Statistics I.

### [3-507.] Statistical Methods in Engineering and Industrial Production (1954-55 and alternate years)

Year, 2 credits each semester

W. R. PABST

### 3-515. Publication of Statistical Reports

Fall, 2 credits (alternate years)

MORRIS B. ULLMAN

Data and their description, tabular presentation, statistical practices involved in data presentation, use of graphics, programming, and evaluation of existing statistical reports. *Prerequisite:* A course in elementary statistics.

### [3-520.] Government Statistics (1954-55 and alternate years)

Year, 2 credits each semester

MORRIS B. ULLMAN

### [3-535.] Statistical Techniques in Biometry and Medicine (1954-55 and alternate years)

Fall, 2 credits

JEROME CORNFELD and JACOB LIEBERMAN

### 3-560. Theory of Electronic Digital Computing Machines

Year, 2 credits each semester

EDWARD W. CANNON

Mathematical requirements for electronic digital computers. Alternative methods of sequencing automatic computers—instruction codes. Electronic computer systems and components—internal memory, control, arithmetic unit, input-output devices. Performance characteristics of electronic computers; analysis of errors. Preparation of problems for machine solution. *Prerequisite:* Advanced calculus or differential equations.

### 1-570. Design of Experiments in Biological Sciences

(See p. 17)

### 5-571. Design and Interpretation of Experiments in Physical Sciences

(See p. 56)

### 5-572. Experimental Design in Physical Sciences—Seminar

(See p. 56)



# Office Techniques and Operations

DEPARTMENTAL COMMITTEE

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EDMUND STEPHENS

## CLERICAL-ADMINISTRATIVE PROCEDURES

The courses described under Clerical-Administrative Procedures are closely related to those offered in the Department of Public Administration and are an integral part of the program leading to the Certified Statement of Accomplishment in Administrative Procedures. They are practical, how-to-do-it, courses chiefly of interest to persons in grade GS-7 positions, or below, who are either working with these procedures, or who hope to train themselves for such positions, or positions requiring some familiarity with more than one of these procedural subjects (e.g., administrative assistants and head clerks). High school graduation is a basic requirement for admission to these courses; exception will be made only on the basis of proven equivalent experience.

### CERTIFIED STATEMENT OF ACCOMPLISHMENT IN ADMINISTRATIVE PROCEDURES

The program leading to a Certified Statement of Accomplishment in Administrative Procedures should be of special interest to:

1. Persons already employed in administrative work of the procedural type, emphasizing techniques and skills.
2. Employees who aspire to enter administrative work but who, because of lack of college education, find their opportunities in that field greatly limited.
3. Employees who wish to prepare to become administrative assistants or to head units concerned with administrative procedures.

### *Requirements*

1. High school diploma or equivalent.
2. Sixteen semester hours of credit with grades of "C" or better in Graduate School courses, distributed as follows:
  - a. A course in American National Government.
  - b. A minimum of eight credits (in addition to *a* above) selected from courses above the 100 level in Clerical-Administrative Procedures, or from courses offered in the Depart-

ment of Public Administration (excluding all accounting courses except Federal Government Accounting) or a combination of these.

- c. The remaining credits may be selected from courses, not included above, in the Department of Office Techniques and Operations, excluding all shorthand courses.
- d. A course in elementary statistics may be included. It is not required. If it is included, three credits may be deducted from c above.

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## CLERICAL-ADMINISTRATIVE PROCEDURES

### 4-101. Everyday Mathematics

Fall, 2 credits. Repeated in Spring and Summer

RALPH R. BOTTS

Designed for clerical workers who are called upon to apply fundamentals of arithmetic to their jobs. Emphasis will be placed on review of business arithmetic including fractions, ratios, proportion, percentages, common divisors and multiples, progressions and elementary graphs and statistics. Special applications will be made to business problems such as simple interest; simple, bank, cash and trade discount; profit and loss; sales turnover; equation of partial payments and accounts; commuting debts; compound interest; compound discount; and annuities. Use of calculating machine will be explained.

### 4-108. Administrative Procedure

Fall, 2 credits. Repeated in Spring and Summer

THOMAS J. HICKEY

Intended for persons who wish to become supervisors or administrative assistants or who are now serving in such capacity in a small organizational unit. Deals with the aspects of the day to day assignments for which these persons ordinarily are responsible, such as preparation of budget data for small organizational units; the proper establishment of authority and responsibility and organization structure; fundamentals of personnel administration; essential requirements for good supervision.

The second part of this course deals with the introduction to administrative planning, administrative procedures and management generally at the lowest organization level, including work reporting and work measurements, work processes and work control reports; relation of these studies to the budgetary and personnel needs of the unit; and the theory of staff versus operating jurisdiction over administrative planning.

### 4-110. Federal Auditing Procedure

Fall, 2 credits

HAROLD J. SELINSKY

This intensive one-semester course is intended for those having no previous knowledge of the subject and is designed to furnish fundamental training for employees now in lower grades as clerks, typists, machine operators, etc., who intend to take the course on Advanced Federal Auditing Procedure or who have opportunities of eventually becoming auditors by serving apprenticeships. It covers explanations of, discussions on and practice work with the two most common types of Government vouchers; deals with, to a limited extent, certain related documents and procedures and should prepare students for higher grades and better-paying positions.

### 4-112. Federal Accounting Procedure

Fall, 3 credits. Repeated in Spring and Summer

RONALD E. HERREN  
JOHN L. TIERNEY

Designed particularly to train accounting clerks through instruction of employees now working in lower grades and to assist accounting clerks in present

and prospective positions. It embraces explanation of, discussion on, and practice work with the basic ledgers (allotment ledger, objective classification ledger, and general ledger) maintained in connection with funds made available to Federal agencies. Appropriation, apportionment, allotment, disbursement, collection, and reporting processes will be discussed and the relationship between administrative accounts and accounts kept by the Treasury Department and the General Accounting Office explained.

#### **4-113. Federal Property Procedure**

Fall, 2 credits

RALPH G. MCINTYRE

An elementary course covering principles and procedures in the utilization, accountability, and disposal of Federal personal property. Designed to furnish persons currently employed in this field an opportunity to learn the mechanics of their day-to-day jobs through a short intensive study of the prescribed policies and regulations and accepted practices. Acquaints the student with the essential operations in connection with: property inventorying; accountability records and controls; borrowing and loaning; lost, damaged, or destroyed property; development and application of equipment utilization and replacement standards; transfers and disposals; sales; donations; destruction or abandonment; determination of requirements; management through inventory controls; nomenclature; and statistical reporting of motor vehicle operation.

#### **4-114. Federal Personnel Procedure**

Fall, 2 credits. Repeated in Spring and Summer

VERNA C. MOHAGEN

Deals with the elementary principles and procedures of Federal personnel administration, including a study of the Federal personnel structure and organization, history and progress of the merit system, rules and regulations of the Civil Service Commission, and other basic procedural sources; use of personnel forms and records; Civil Service examinations and recruitment; appointments; transfers; promotions; separations and reductions in force; suspensions and disciplinary actions; retirement; performance ratings; leave and hours of duty; personnel reports, applications of Decisions of the Comptroller General, administrative policy statements, and administrative orders.

#### **4-115. Federal Purchasing Procedure**

Year, 2 credits each semester

TONY M. BALDAUF

This course is designed to assist employees, who are engaged in purchasing work or wish to get into it, in learning the detailed requirements of laws, regulations, and procedures applicable to procurement from Federal sources of supply and purchasing or contracting for supplies and services in the open market; the practical application of such requirements through the preparation of procurement and related documents covering the more common types of transactions; and solution of problems pertaining thereto. The fall semester is devoted to those phases having general application to purchasing and contracting but more specifically to procurement from Federal sources of supply and purchasing not requiring the solicitation and acceptance of bids.

The spring semester is devoted to acquiring knowledge of basic laws, regulations, and procedures needed in making the simpler contracts arising from competitive bidding or negotiation, with special attention given to the latter as authorized by the Federal Property and Administrative Services Act of 1949.

#### **4-116. Federal Budgetary Procedure**

Fall, 2 credits. Repeated in Spring

CHARLES L. GRANT

JESSE B. MCWHORTER

This course is designed to assist employees either in budget work or preparatory to taking budget work, up to and including Grade GS-9. It deals with budgetary procedures, including the preparation of estimates, justifications,



tabular statements, graphs, etc., and, in connection with budget execution, outlines methods in making allotments, preparation of apportionment and obligation reports, and other methods used in the formulation and execution of the Federal budget.

#### **4-117. Records Management Procedure**

Fall, 2 credits

DOROTHY M. LUTTRELL and ROBERT H. LANDO

A course of instruction in how to process, maintain and service records, designed for students who desire to enter the records management field or who are interested in supplementing their knowledge of the mechanics and techniques of record operations. Includes detailed instructions in methods of (1) recording and controlling communications, (2) classifying, coding and indexing correspondence and other record material, (3) filing records and references, and (4) furnishing records reference service, including the establishment and operation of charge-out and follow-up systems. This course also provides study and discussion of (1) the theory and structure of the various systems of classification and filing, (2) the selection of the proper systems of classification for individual requirements, and (3) the development of individual classification and filing patterns.

#### **4-201. Supervision**

Fall, 2 credits. Repeated in Spring and Summer

EARL D. SHARAR

A course for persons who have or expect to have first-line supervisory responsibilities. Particular emphasis will be placed upon the need for understanding human behavior and attitudes as they manifest themselves in group efforts. The dynamic setting in which supervisory responsibilities are discharged, its importance to management, the individual qualities and specific techniques employed by supervisors to improve work methods will be considered, and a program of self-development and self-evaluation in the art of supervision suggested.

#### **4-208. Advanced Administrative Procedure**

Fall, 2 credits. Repeated in Spring

M. GEORGE GOODRICK

Intended for persons who are now assigned to administrative assistant and supervisory positions. Deals with (1) the conduct of administrative and procedural surveys and audits directed toward the development of factual data for management purposes; the analysis of these data, the preparation of reports and recommendations thereon; (2) the putting into effect of the approved recommendations through the actual drafting of procedural instructions and the designing and standardization of forms; (3) the installation of approved procedures and the establishment of executive controls to insure compliance with approved instructions; (4) the modern and tested techniques and methods ordinarily used in developing factual data and graphic presentations regarding flow of work, organization structure, work assignments, authority, work duplications, delays and bottlenecks; (5) report writing; (6) the value of illustrated presentations of work processes in eliminating duplication of work, in simplifying operations and in cutting out unnecessary steps; (7) the value of and the need for specific written manuals of instructions as tools of management; and (8) the relation of these instructions to those taught in the other Office Techniques and Operations Courses. *Prerequisite:* Completion of one of the following courses: 4-108, Administrative Procedure; or 6-344, Introduction to Public Administration.

#### **4-210. Advanced Federal Auditing Procedure**

Spring, 2 credits

EMMETT B. COLLINS

Includes explanations of and discussion on Federal auditing policy and practice along advanced lines. Covers the relationship of auditing to general fiscal control; administrative examination of fiscal documents; application of legislation and regulations; use of Comptroller General Decisions; relation of Comp-

troller General's Decisions to particular cases; normal methods of handling suspensions, disallowances, certifications, etc.; unusual problems in the audit of standard form 1034 vouchers and 1012 vouchers; relationship of procurement to auditing and the policies followed in the use of purchase orders; authority for travel and policies relating thereto; per diem allowances and computations, and policies respecting rates; transportation of property and personnel, use of transportation requests and bills of lading; audit of transportation vouchers; audit of payrolls and application of payroll procedures; General Accounting Office exceptions and preparation of replies; claims, adjustments and direct settlements. This advanced course in Federal Auditing Procedure is designed to assist auditors to prepare themselves for more responsible and more remunerative positions. *Prerequisite:* Federal Auditing Procedure or equivalent experience.

#### 4-214. Advanced Federal Personnel Procedure

Fall, 2 credits. Repeated in Spring

EUGENE J. PETERSON

Similar to Federal Personnel Procedure but more intensive in its treatment of certain phases of the subject. Deals with advanced principles and techniques in Federal personnel procedures and their relation to operating programs, including a study of the principles of the Civil Service Act, Rules and Regulations, and their application to day-to-day problems in a Federal personnel office; recruiting sources for Civil Service examinations and appointments; study of promotion-from-within procedures; reduction-in-force procedures, and their application to specific operating situations; study of procedures for systematic retirement of employees reaching annuity age; procedures for investigation and enforcement of discipline; periodic reports and their use for operating purposes; procedure and policy statements in the general field of personnel administration; procedural source materials such as the Civil Service Commission, Federal Personnel Manual, Decisions of the Comptroller General, Executive Orders, etc., and applying them to detailed operating procedures; relationship of the personnel office to budget, accounting, payrolling, and other staff functions. *Prerequisite:* Federal Personnel Procedure or equivalent practical experience in a Federal personnel office at Grade GS-4 or above.

#### 4-217. Advanced Records Management

Spring, 2 credits

DOROTHY M. LUTTRELL and ROBERT H. LANDO

Designed to give the student a comprehensive knowledge of the management of Government records. Includes a detailed study of the requirements of the Federal Records Law and action necessary for meeting the requirements of this law; the application of management techniques to the creation, maintenance, utilization, preservation and disposition of records. Also includes a discussion of laws and regulations governing the preservation and disposal of records, appraisal, systematic retirement, storage, disposal and microphotography; the development and application of records retention and disposal standards. *Prerequisite:* Records Management Procedure or consent of instructor.

### GOVERNMENT LETTER AND PROCEDURE WRITING

#### 4-330. Government Letter Writing

Fall, 2 credits. Repeated in Spring and Summer

VERNE L. SAMSON  
ALVIN G. AMES

Intended for persons in administrative positions who are called upon to handle administrative problems through correspondence. The writing of clear, accurate, concise, courteous letters and memoranda. Principles of effective letter writing. Practice in criticizing and revising outgoing correspondence, and in planning and drafting replies to incoming letters. *Prerequisite:* A good foundation in English grammar, vocabulary, and composition, through courses or writing experience.



**4-420. Procedure or Directive Systems**

Fall, 2 credits

SAMUEL E. LANDIS

A study of the various types of procedure or directive systems. Special attention is given to the basic elements of a flexible system and methods of revising procedures, definitive distribution, and improved reproduction processes. Technical procedures functions such as codifying and indexing, development of standards for editing and format, and types of visual presentations are included. The purpose of the course is to provide a technical background for developing and evaluating various procedure systems and to provide techniques for installing and operating effective systems for directives or procedures.

**4-421. Writing Procedures and Instructions**

Spring, 2 credits

KAY PEARSON

A course of instruction in how to develop and write manual issuances, circulars, office memoranda, and other forms of rules, regulations, instructions, and procedures. Special attention will be given to ways of improving readability of such material, the use of a clear, simple style of writing, proper format, and use of "ready-reference" aids. It will provide drill in the practical application of principles and theories of procedure to actual writing. The purpose of the course is to provide students with group experience in writing procedures and instructions and in applying editorial and format standards. *Prerequisite:* Procedure or Directive Systems, or one year of experience in writing procedures at Grade GS-5 or above.

**4-422. Systems for Reports and Forms Management**

Fall, 2 credits

EDWARD J. LEWIS and WILLIAM B. RICE

Designed to provide students with a comprehensive knowledge of forms and reports management systems and how to operate them. A study of: various systems used for controlling forms and reports; different techniques used in Government for forms design and format; standards and printing specifications; methods for analyzing forms and reports; and how to install and operate forms and reports management programs. Analysis of forms and reports by case studies with group discussion of techniques involved. Special lectures by top technicians from representative Government departments.

**SECRETARIAL PRACTICES****4-325. Effective Secretarial Practices**

Fall, 3 credits

ELLEN S. GROFF

A course of study presenting an analysis of the secretarial profession, stressing the general duties required of a secretary, the development of a secretarial personality and occupational intelligence, with practical and realistic discussion of secretarial procedures. Special emphasis placed on modern alphabetical filing system and dictation of business letters. For secretaries and stenographers in government and private industry.

**SHORTHAND**

These courses are designed to furnish Federal employees an opportunity to follow a program of training for stenographic careers in the Federal service. While each course represents a separate unit of study, with emphasis on material used in the Federal service, a proper sequence of courses insures a sound foundation for successfully qualifying for the various grades and classifications of stenographers in the Federal service.

"Review of Gregg (Anniversary)" will serve as rapid review for the student who has not applied his shorthand knowledge for a long time, or has used it so little that he feels uncertain about applying his knowledge to practical office dictation. Students wishing a review of Gregg Simplified should enroll in "Gregg, 60 to 80 Words."

"Gregg, 100 to 130 Words" is an intensive course on technical material. Students should have a sound foundation in theory and be able to write 100 words a minute with a 95 percent accurate transcript before registering for the course.

The three courses in Reporting Shorthand are open to stenotypists as well as Gregg writers.

Home study is required in all the courses to attain goals set in course descriptions. Amount of study required varies according to the learning habits and individual goals of students.

A prerequisite for all shorthand courses is the ability to type-write with a fair degree of accuracy and speed.

The following outline is a general guide for employees who wish to plan a course of study to build for a stenographic or stenographic-reporting career in the Federal service:

<i>Course</i>	<i>Goal</i>	<i>Prerequisites</i>
Gregg Shorthand Simplified I	Ability to apply all the basic principles of Gregg Shorthand Simplified; mastery of all the brief forms; ability to read shorthand plates at a fairly rapid rate; ability to write legible outlines and to take dictation of new and practiced material.	For those who have not studied shorthand, or for those who have some knowledge of shorthand but have not completed basic theory.
Gregg Shorthand Simplified II	An increasing mastery of principles of Gregg Shorthand Simplified (by review and drill); ability to construct new shorthand outlines; ability to take dictation of new standard material at a minimum of 60 words a minute and to produce accurate transcripts.	For those who have completed Gregg Shorthand Simplified I or its equivalent.
Gregg Shorthand Simplified, 60 to 80 Words	Theory review; ability to take dictation at 80 words a minute for 5 minutes; ability to produce acceptable transcripts of letters and reports dictated at rates varying from 60 to 80 words a minute.	For those who have completed Shorthand I and II or equivalent theory and dictation courses and who have a minimum speed of 60 words a minute on new, standard material.

<i>Course</i>	<i>Goal</i>	<i>Prerequisites</i>
Gregg Shorthand, 80 to 100 Words	Ability to take dictation of new, standard material at 100 words a minute for 5 minutes; ability to produce, at a good rate of speed, accurate transcripts of letters, reports, conferences, and telephone conversations.	For those who have a minimum dictation speed of 80 words a minute using either the Simplified or Anniversary system and who are able to produce accurate transcripts of letters and reports.
Gregg Shorthand, 100 to 130 Words	Ability to take dictation of new, standard material at 130 words a minute for 5 minutes; ability to produce, at a good rate of speed, accurate transcripts of letters, reports, conferences, and telephone conversations.	For those who have a minimum dictation speed of 100 words a minute and who are able to produce accurate transcripts of letters and reports.
Introduction to Reporting—Gregg, 130 to 150 Words	Ability to record conferences and hearings 60 to 70 percent verbatim; introduction to reporting techniques.	For those who have qualified on 130-word a minute standard tests or their equivalent. Open to stenotypists.
Reporting—Gregg, 150-175 Words	Ability to use high-speed short-cuts and advanced reporting methods; verbatim reporting of lectures, hearings, and conferences.	For those who have qualified on 150-word a minute standard test or the equivalent. Open to stenotypists.
Reporting—Gregg, 175-200 Words	Ability to use high-speed short-cuts and advanced reporting methods; verbatim reporting of lectures, hearings, and conferences.	For those who have qualified on 175-word a minute standard test. Open to stenotypists.

#### 4-89. Review of Gregg Shorthand (Anniversary)

Fall, non-credit. Repeated in Spring and Summer.

VIVIAN W. FLINCHUM

A review of theory and brief forms. Reading from shorthand plates and students' own notes; dictation of standard material at various progressive rates of speed. *Prerequisite:* Completion of the Gregg Manual or its equivalent by the Anniversary system.

#### 4-129. Gregg Shorthand Simplified I

Fall, 3 credits. Repeated in Spring and Summer

GERALDINE M. FITEZ  
NEVA I. TAYLOR  
KATHRINE WILKEY

#### 4-130. Gregg Shorthand Simplified II

Fall, 3 credits. Repeated in Spring and Summer

MARGARET O. HOBBS  
NEVA I. TAYLOR  
KATHRINE WILKEY

#### 4-225. Gregg Shorthand Simplified, 60 to 80 Words

Fall, 3 credits. Repeated in Spring and Summer

E. DONALD BELL

**4-226. Gregg Shorthand, 80 to 100 Words**

Fall, 3 credits. Repeated in Spring and Summer

RALPH ROWLAND

**4-231. Gregg Shorthand, 100 to 130 Words**

Fall, 3 credits. Repeated in Spring

E. DONALD BELL

**4-335. Introduction to Reporting—Gregg, 130 to 150 Words**

Fall, 4 credits. Repeated in Spring

FRANCES A. BUTLER

**4-336. Reporting—Gregg, 150 to 175 Words**

Fall, 4 credits. Repeated in Spring

EUDORA K. BERNARD

**4-337. Reporting—Gregg, 175-200 Words**

Fall, 4 credits. Repeated in Spring

JACK ROMAGNA

## Physical Sciences

DEPARTMENTAL COMMITTEE

HENRY STEVENS (Chairman)

S. W. BOGGS  
L. W. CURRIER  
ELSA O. KEILES

ARNOLD J. LEHMAN (Vice-chairman)  
JOSEPH B. LEVY  
MARK L. NICHOLS  
HARRY WEXLER

—O—

The courses in this department offer unusual opportunities for study under the guidance of scientists working in this field. The program will be of value to students who plan to enter these sciences; to those who desire to increase their knowledge of the science in which they now earn their living; and to those who wish, for cultural reasons, to learn more about these fields.

Most of the courses in this department are seminars designed to keep professional workers informed of recent developments in their fields and do not include laboratory work. A few of the courses offer basic training and, as indicated in the course descriptions, include laboratory work.

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## CHEMISTRY

### 5-315. Elementary Biochemistry

Year, 2 credits each semester (alternate years)

SIDNEY M. HESS

The first semester's material will cover pH, oxidation-reduction, the chemistry of carbohydrates, fats, proteins, and the fundamentals of enzyme chemistry. The second semester will deal with the digestion and absorption of food, intermediary metabolism, excretion, vitamins, and hormones. Lectures, discussion, and examinations. *Prerequisite:* Organic chemistry.

### 5-349. Physical Chemistry

Year, 2 credits each semester (alternate years)

WILLIAM HORWITZ

Lecture course on the states of matter—gases, liquids, and solids; elementary thermodynamics, solutions, homogeneous and heterogeneous equilibria including the phase rule; ionic equilibria, conductance, electromotive force; chemical kinetics and colloids. *Prerequisite:* General chemistry, qualitative and quantitative analysis, physics, and calculus, or permission of the instructor.

### 5-400. Advanced Organic Chemistry

Year, 2 credits each semester (alternate years)

WILBUR I. PATTERSON

An advanced course in principles of organic chemistry. Reactions of the aliphatic, aromatic, carbocyclic and heterocyclic compounds will be considered. Newer developments will be presented, particularly methods for the determination of structure. *Prerequisite:* Organic chemistry.



[5-515.] **Physical Biochemistry** (1954-55 and alternate years)  
Year, 2 credits each semester

WILLIAM HORWITZ

### 5-522. Advanced Biochemistry

Year, 2 credits each semester (alternate years)

SIDNEY M. HESS

A detailed study of behavior and properties of vitamins, hormones and enzymes; the nature of biological catalysis; hydrolytic, phosphorolytic, and oxidizing enzymes; intermediary metabolism of amino acids, carbohydrates, and fats; and related subjects. *Prerequisite:* Elementary biochemistry or consent of the instructor.

[5-540.] **Introduction to Chemical Kinetics** (1954-55 and alternate years)

Fall, 2 credits

JOSEPH B. LEVY

### 5-541. Theoretical Organic Chemistry

Spring, 2 credits

JOSEPH B. LEVY

The theoretical aspects of organic reactions. Includes the theory of resonance aromatic substitution and in general the principles which govern and explain the way organic reactions occur. *Prerequisite:* Undergraduate course in organic chemistry.

### 5-542. Physical Organic Chemistry

Fall, 2 credits (alternate years)

JOSEPH B. LEVY

Certain branches of organic chemistry which are not covered in most treatments of the subject. Includes reaction mechanisms, the effect of structure on reactivity and various related topics. *Prerequisite:* Organic and physical chemistry.

[5-545.] **Alkaloids, Glucosides, and Toxins of Biological Importance** (1954-55 and alternate years)

Spring, 2 credits

GEOFFREY WOODARD and SPECIALISTS

### 5-550. Pharmacology of Insecticides

Spring, 2 credits (alternate years)

BERNARD DAVIDOW

Insecticides, rodenticides, fungicides, and insect repellents discussed with regard to identity, acute, chronic, and dermal toxicities, biochemistry, pharmacodynamics, and pathology. *Prerequisite:* Bachelor's degree or equivalent in biology or chemistry; knowledge of physiology desirable.

### 5-625. Specialized Analytical Techniques

Fall, 2 credits

GEOFFREY WOODARD and STAFF

A detailed discussion of some of the physical methods used in analytical work for determination, separation, or identification, particularly of organic compounds. Among the methods covered are ultraviolet, visible, and infrared spectrophotometry, partition, adsorption, and paper chromatography, and counter current distribution. Emphasis is placed on practical applications. Laboratory demonstrations are included where possible.

[5-630.] **Enzymatic Basis of the Pharmacological Action of Drugs** (1954-55 and alternate years)

Fall, 2 credits

CARTER D. JOHNSTON and STAFF

### 8-188. Glass Blowing

(See p. 102)

## GEOGRAPHY AND GEOLOGY

Students who are studying or working in the field of geography will be interested, in addition to the geography courses listed here, in courses in Soil Sciences, Meteorology, and Surveying and Mapping.

**5-114. Maps and Charts**

Fall, 2 credits

CATHERINE I. BAHN

A course designed to give the analyst, researcher, librarian or teacher who works with maps an understanding of both domestic and foreign maps and charts, the agencies which produce them, their catalogs and indexes. Presents methods in reading and problems in interpreting foreign maps. United States, foreign and international mapping activities will be studied on a workshop basis to permit presentation and solution of individual problems. All types of maps, charts, aids and reference materials will be available for laboratory use.

**[5-420.] Physiography of Eastern United States (1954-55 and alternate years)**

Fall, 2 credits

ESTHER J. ABERDEEN

**5-421. Physiography of Western United States**

Fall, 2 credits (alternate years)

ESTHER J. ABERDEEN

A survey of the physiographic provinces and sections of the United States lying west of the Central Lowland. The work of the course will involve lectures, informal discussions, reviews of significant papers, and map studies, with special emphasis on the geologic foundations of land forms. *Prerequisite:* Courses in physical and historical geology.

**5-435. Elements of Physical Geology**

Fall, 3 credits (alternate years)

MEYER RUBIN

Minerals and rocks as constituents of the earth's crust; processes of weathering, erosion and deposition; vulcanism; structures of sedimentary and igneous rock formations; diastrophism; mountain building; land forms and their relation to various geologic processes; stability of the earth's crust. The course includes classroom exercises in the study of common minerals and rocks, and interpretation of topographic and geologic maps. *Prerequisite:* Inorganic chemistry is desirable.

## METALLURGY

**5-453. Principles of Process Metallurgy**

Fall, 2 credits

BLAKE M. LORING

The winning of metals from ores; geographic distribution; methods of reduction, refining, and purification; time required for construction and operation of metallurgical plants; allied industries; skills required; power consumption; alternative methods; efficiency and quality. Existing and proposed methods for production of iron and steel, copper, lead, zinc, and other metals. *Prerequisite:* College degree recommended; course in elementary chemistry required.

**5-528. Principles of Engineering Alloys**

Spring, 2 credits

BLAKE M. LORING

Manufacture, heat treatment, and special characteristics determining usage and availability of plain carbon steel, special steels, and non-ferrous alloys such as aluminum, magnesium and titanium. *Prerequisite:* Degree in engineering.

## METEOROLOGY

The following courses in meteorology are offered in cooperation with the United States Weather Bureau. The courses may be taken singly, or as a program leading to a certificate of accomplishment. Registration in these courses is not limited to employees of the Weather Bureau.

## CERTIFIED STATEMENTS OF ACCOMPLISHMENT IN METEOROLOGY

Two Certified Statements of Accomplishment are offered in meteorology. The required programs, with the suggested chronological order of courses, are outlined below. The First Certified Statement of Accomplishment in Meteorology may be awarded to the student who satisfactorily completes the required courses totaling 19 credits. The Second Certified Statement of Accomplishment in Meteorology may be awarded to the student who completes the courses totalling 36 credits. The courses may be taken at a faster rate than the one suggested in the program, with special permission of the Departmental Committee.

The required courses, Calculus and Physics for Meteorology, are considered to be the absolute minimum in mathematics and physics. A more complete preparation, and the one recommended to the person who wishes to make of meteorology his professional career, will require courses also in differential equations and vector analysis, plus at least a one-year course in college physics, with laboratory. Courses in chemistry and statistics would be valuable, but not essential.

## COURSES LEADING TO CERTIFIED STATEMENT OF ACCOMPLISHMENT IN METEOROLOGY

*First Statement—Elementary*

Required Prerequisite Courses. May not be used to meet the credit hour requirement for the certified statement. Equivalent courses will be accepted by transcript from other institutions.

The number in parenthesis after the course title indicates semester hour credits.

Calculus (8)

Physics for Meteorology (3) or a year course in college physics

## Required Meteorology Courses.

*First Year*

Synoptic Meteorology (6)

Physical Meteorology (3)

*Second Year*

Introduction to Dynamic Meteorology (6)

Weather Analysis and Forecasting (4)

*Second Statement—Advanced*

Courses required for the first statement plus the following:

*Third and Fourth Years*

General Climatology (3)

Advanced Weather Analysis and Forecasting (6)

Electives (8 credits) selected from the following courses:

Hydrology	Methods in Climatology
Elements of Fluid Mechanics	Applied Climatology
Atmospheric Radiation	Elements of Dynamic and Synoptic Climatology
Selected Topics in Meteorology	General Oceanography

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## 5-162. Principles of Meteorology

Fall, 2 credits

ALBERT V. CARLIN

A non-technical course designed for persons interested in the general aspects of weather and for those concerned with the application of weather to their particular field of study.

The first part of the course includes weather instruments and observations, the properties, processes and general circulation of the atmosphere, storms, and climatic conditions of the United States. The use of daily maps and forecasts is discussed.

The second part is a survey of the effect of weather and climate on man and his activities, including agriculture, aviation, transportation, public utilities, business, industry, health and recreation.

## 5-212. Physics for Meteorology

Fall, 3 credits

JAMES E. CASKEY, JR.

Topics in college physics with emphasis on applications to meteorological problems. (Subject matter may be varied to meet needs of class.) *Prerequisite:* Calculus.

## 5-310. Statistical Methods in Climatology

Fall, 2 credits

H. C. S. THOM

A study of modern climatological methods with emphasis on statistical analysis as applied to meteorological data. Elementary concepts of probability are discussed with application to discrete and continuous climatological series. The basis for climatological prediction is developed together with fundamental principles of the application of meteorology to technology. The distributions of the simple climatological elements are discussed and applications made to meteorological data. Simple regression and analysis of variance theory are developed for use in applied meteorological problems. Confidence interval theory and tests of significance are emphasized throughout the course. *Prerequisite:* A knowledge of elementary meteorology.

## 5-415. Applied Climatology

Fall, 3 credits

WOODROW C. JACOBS

The application of well known climatological methods toward solving specific weather problems of business, industry, air and surface transportation, and agriculture. Emphasis is placed on application of climatological methods in the solution of applied problems. The case method of class presentation is employed throughout the course. *Prerequisite:* A knowledge of the basic principles of meteorology. Course 5-310 and/or a knowledge of elementary statistics is helpful but not required.

## 5-533. Hydrology

Year, 3 credits each semester

MAX A. KOHLER

A two-semester course in basic and applied hydrology at the professional level. The first semester will be largely descriptive, covering such topics as ele-



mentary hydraulics; measurement and interpretation of streamflow, precipitation and other basic data; the hydrologic cycle; physics of soil moisture; the infiltration theory; wave travel and the unit hydrograph. The second semester will cover the development and application of procedures for applying basic hydrology to practical problems of river forecasting and design of water control works including such subjects as streamflow routing, flood frequency, the rational method of estimating flood magnitude, hydrometeorology, forecasting of runoff, influence of water control structures on streamflow, and problems of water control operation. *Prerequisite:* Physics and algebra; elementary meteorology, statistics, and engineering desirable.

### 5-534. Introduction to Dynamic Meteorology

Year, 3 credits each semester

LEWIS D. KAPLAN

Designed to illustrate the use of higher mathematics and physics in the interpretation of meteorological phenomena, and in the development of forecasting techniques. *Prerequisite:* Calculus, or consent of the instructor.

### 5-535. Elements of Fluid Mechanics

Year, 2 credits each semester

MORRIS TEPPER

A basic one year course in the foundation of fluid mechanics aimed at giving the student a physical feeling for the more important concepts and relationships involved in problems concerning the flow of fluids. Topics will include: Flow models, basic concepts such as density, pressure, vorticity, viscosity, capillarity, etc., conservation laws, Bernoulli's equation, dimensional reasoning, characteristic parameters such as Froude number, Reynolds number and Mach number, potential flow, surface waves, elements of viscous flow and an introduction to compressible flows. *Prerequisite:* College physics and mathematics through differential and integral calculus.

### 5-536. Synoptic Meteorology

Year, 3 credits each semester

SIDNEY TEWELES, JR.

A two-semester course in the fundamentals of modern synoptic meteorology for the professionally interested student. First semester: Air motion in the atmosphere, the general circulation, air masses, fronts, cyclones and anticyclones. Second semester: Distribution of precipitation, fog, etc., geographically and with respect to fronts and pressure centers, features of the upper levels, prognostication of sea-level and upper-air charts, forecasting weather. *Prerequisite:* Physics for meteorology or college physics, and calculus; or consent of instructor.

### 5-537. Physical Meteorology

Spring, 3 credits

SIGMUND FRITZ

Solar and terrestrial radiation, composition of the atmosphere, measurement and instrumentation, condensation processes, atmospheric optics, acoustics, and electricity, kinetic theory, thermodynamics and statics. *Prerequisite:* Calculus.

### 5-538. Weather Analysis and Forecasting

Year, 2 credits each semester

THOMAS I. GRAY, JR., and JAY S. WINSTON

A laboratory course in which concepts of air masses, fronts, and mid-tropospheric flow patterns are applied to analysis and prognosis of sea level and upper air weather charts for North American and adjacent areas. Short range forecasts of various weather elements are prepared for local and regional areas of the United States. *Prerequisite:* Synoptic Meteorology or equivalent.



**5-539. Elements of Dynamic and Synoptic Climatology**

Spring, 2 credits

WOODROW C. JACOBS

The methods of dynamic and synoptic meteorology are utilized to develop a theoretical global climatology. The causes of regional and seasonal variations in climate are emphasized. Climatological data are used only to verify theoretically derived climatic models. *Prerequisite:* Physical and Synoptic Meteorology or its equivalent, or consent of the instructor.

**5-544. General Climatology**

Fall, 3 credits

HARRY F. HAWKINS, JR.

Discussion of the distribution of radiation, temperature, winds, pressure, hydrometeors, and of the factors which influence their distribution at earth's surface and aloft. Description of climatic zones and types. The distribution and variations of air masses, fronts, cyclones, anticyclones and tropical storms. Climatological significance of blocking and of mean troughs and ridges. Regional climatic differences from synoptic implications. Discussion of microclimatology vs. climatology. *Prerequisite:* Physical meteorology and synoptic meteorology.

**5-548. Atmospheric Radiation**

Spring, 3 credits

LEWIS D. KAPLAN

An introduction to the fundamental principles of radiative heat transfer and their application to atmospheric processes. Among the topics discussed are: kinetic theory of gases, radiation laws, nature of the absorption spectra of gases, variation of absorption with temperature and pressure, determination of albedo and the solar constant, radiation diagrams, greenhouse effect, heat balance of the atmosphere, calculation of nocturnal cooling of ground and clouds. *Prerequisite:* Dynamic Meteorology or Calculus.

**5-580. Advanced Weather Analysis and Forecasting**

Year, 3 credits each semester

THOMAS I. GRAY, JR., and JAY S. WINSTON

Weather data for various regions of the earth are analyzed. More detailed and experimental analysis of data is emphasized including: study and use of isentropic charts, constant vorticity trajectories, vertical motion computation, jet stream analysis, and frontal contour charts. Important forecasting problems, such as cold waves, heat waves, and severe regional and local storms are investigated. Objective forecast methods for various weather elements are discussed. Methods of extended period forecasting based on motion and development of planetary wave patterns are presented. Lecture and laboratory. *Prerequisite:* Weather Analysis and Forecasting, Synoptic Meteorology, or equivalent.

**5-705. Selected Topics in Meteorology**

Year, 3 credits each semester

JAY S. WINSTON and OTHERS

An advanced seminar course designed to cover various aspects of the current state of meteorology. Review and discussion of articles from the Compendium of Meteorology and other sources. The topics covered are agreed upon by students and instructor. *Prerequisite:* Physical and Synoptic Meteorology, Dynamic Meteorology, or consent of the instructor.

## OCEANOGRAPHY

**5-465. General Oceanography**

Year, 2 credits each semester

RICHARD C. VETTER

A two-semester course covering the basic concepts of oceanography. The first semester includes such topics as: history of oceanography, size and shape of the oceans, major ocean currents and water masses, physical and chemical properties of sea water, the biological environment of the sea and submarine geology.

The second semester emphasizes practical applications of oceanographic research covering such topics as wave forecasting, under-water sound, problems in oceanographic instrumentation, and interrelationships of problems in biological, physical, chemical, and geological oceanography. *Prerequisite:* College courses in at least two of the physical or biological sciences. Students who wish to receive graduate credit are required to present a term paper.

## SOIL SCIENCES

**5-156. Soil Conservation**

Fall, 2 credits (alternate years)

J. GORDON STEELE

A practical course about soil conservation farming. Why we need to conserve soil. What happens to water on the land and in the soil. Changes in soils due to erosion, deposition, leaching, and depletion. Changes due to cropping and grazing, including changes in structure, permeability, and fertility. Long-time changes in soil development compared with short-time changes. Practices for maintaining soil and controlling runoff and erosion. Influence of soil, slope, and climate on capability of land for crops, grazing, woodland, and other uses. Selecting land uses and conservation practices that fit land capability and that fit together in a practical, basic farm or ranch conservation plan. The work of soil conservation districts.

**[5-405.] Soils—Their Origin and Geography (1954-55 and alternate years)**

Spring, 3 credits

CONSTANTIN C. NIKIFOROFF

**5-531. Soils: Their Morphology, Genesis, and Classification**

Spring, 3 credits

CONSTANTIN C. NIKIFOROFF

The nature of soils and the broad principles governing their behavior are first discussed, followed by consideration of soil morphology, formation, and classification. Particular attention is given to characteristics of the great soil groups and their genesis in relationship to the physical and biological forces of the environment. Soil geography of the United States is dealt with broadly, but some examples from other parts of the world are used. Throughout the course, relationships of soil characteristics to agricultural development, soil use and conservation, and patterns of human occupancy are emphasized. *Prerequisite:* Freshman chemistry or its equivalent. Previous training in soils, plant physiology, geography or geology is desirable.

**5-560. Soil Physics**

Fall, 2 credits (alternate years)

C. S. SLATER

Deals with the physical properties of soils of importance to agriculture. Basic physical laws are applied to interpret soil phenomena. Topics include the soil entity, colloids, air and water relationships, structure, measurement of

physical properties, relation of such properties to agricultural productivity, erosion and runoff, and modification of soil physical properties through use. *Prerequisite:* Degree in one of the sciences with courses in physics and chemistry, or permission of the instructor.

#### DESIGN OF EXPERIMENTS

### 5-571. Design and Interpretation of Experiments in Physical Sciences

Fall, 2 credits (alternate years)

GLENN L. BURROWS

An introductory course concerned with setting forth (a) the characteristics of a good experiment, (b) experimental designs and the associated statistical techniques for analyzing the data, and (c) methods for improving the precision of experiments. The topics will be illustrated by examples. *Prerequisite:* A degree in one of the sciences and Principles of Statistical Analysis or equivalent, or consent of the instructor.

### 5-572. Experimental Design in the Physical Sciences—Seminar

Spring, 2 credits (alternate years)

GLENN L. BURROWS

Discussions of problems in experimental design in chemistry, physics, and engineering. *Prerequisite:* A degree in one of the sciences or engineering; knowledge of elementary statistics.

# Public Administration

## DEPARTMENTAL COMMITTEE

EARL W. LOVERIDGE (Chairman)

GLADYS L. BAKER

K. A. BUTLER

H. DEAN COCHRAN

ROWLAND EGGER

PATTERSON FRENCH (Vice-chairman)

WILLIAM A. MINOR

HARLOW S. PERSON

JOHN H. THURSTON

The importance of public administration in the modern state is apparent. The management problems of government now require personnel with more and better training in public administration. This is true particularly in regard to the junior and assistant positions.

Many of the ablest and most experienced public administrators in the United States are in Washington. Utilizing this unexcelled talent, the Graduate School offers courses to meet the needs of the Federal service in this field.

## CERTIFIED STATEMENTS OF ACCOMPLISHMENT IN PUBLIC ADMINISTRATION

### COMMITTEE

GLADYS L. BAKER (Chairman)

PATTERSON FRENCH

JOHN H. THURSTON

Certified Statements of Accomplishment are granted to undergraduate and to graduate students who have completed an organized course of study in public administration intended to provide basic training for responsible administrative work.

The programs leading to a Certified Statement of Accomplishment in Public Administration should be of special interest to:

1. Persons already employed in responsible administrative positions. Included in this group are many with specialized training who have been transferred to administrative positions from professional positions without training or previous experience in administration.
2. Junior Management Assistants. Those who entered the service with a management option may profit from courses both more advanced and more specialized than those taken in college. Those who entered on various professional options and are now employed in such professions can profit very greatly from these courses if they expect, or wish to prepare, to enter into administrative work connected with their professional fields.



3. Employees who wish to broaden their understanding and improve their efficiency through a "tour of duty" by study, in lieu of an actual tour of duty for which they have found no opportunity.
4. Employees with college background who aspire to transfer to a career in administrative management.
5. Administrative assistants and administrative technicians of all kinds.

### *Requirements—Undergraduate Study*

*Students seeking this statement should consult with the Registrar and obtain approval of their proposed course of study early in their academic program.*

1. High school diploma or equivalent.
2. Twenty-four semester hours of credit with grades of "C" or better in college level courses in the social sciences.

Much importance is attached to general background courses in the belief that they help to broaden the thinking and understanding of the student so that he will possess a wider range of ideas and interests and sounder judgment of social values than would otherwise be the case and, in consequence, will be able to render Government service of a higher level of value. For this reason, these requirements will not be waived.

With the approval of the Registrar of the Graduate School, credit may be given for not more than six hours of other courses which are considered to be of value in connection with work in public administration (such as English literature, composition, philosophy, mathematics, or natural sciences). Introductory courses in the following must be taken:

American or European Government or Political Science  
Economics

American or European History

Public Administration

3. Twenty-four semester hours of credit with grades of "C" or better in undergraduate and graduate courses in public administration, excluding all accounting courses except Federal Government Accounting. The 24 credit hours are to be distributed as follows:
  - a. A minimum of nine credits from the Division of Organization and Management.

- b. The remaining fifteen credits may be selected from the Divisions of General Administration (courses 6-545 and 6-600 only may be applied here), Financial and Budgetary Administration, Personnel Administration, Legal Administration, Procurement and Property Management, or additional courses in the Division of Organization and Management. Students are advised to include in their programs at least one course from each Division.
- c. Upon prior approval by the Registrar, credit for courses outside the Department of Public Administration (including not more than two courses in office techniques and operations) may be applied when such courses are properly in line with the student's major interest.
- d. When a student has completed the social science requirements and fifteen hours in public administration courses, he should review his course of study with the Registrar.

### *Requirements—Graduate Study*

*Students seeking this statement should consult with the Registrar and obtain approval of their proposed course of study early in their academic program.*

1. Bachelor's degree. This requirement will be waived only in very exceptional cases when the student can offer educational accomplishments substantially equivalent to a Bachelor's degree and when he has demonstrated by appropriate examination the breadth of knowledge equivalent to such a degree in the social sciences.
2. Twenty-seven semester hours of credit with grades of "B" or better in advanced undergraduate and graduate courses in public administration, of which twelve hours of credit shall be for courses numbered 500 and above, and excluding all accounting courses except Federal Government Accounting. The 27 credit hours are to be distributed as follows:
  - a. A minimum of ten credits from courses in the Division of Organization and Management.
  - b. Fourteen credits selected from the Divisions of General Administration (course 6-545 only), Financial and Budgetary Administration, Personnel Administration, Legal Administration, Procurement and Property Management, or additional courses in the Division of Organization and Management. Students are advised to include in their programs at least one course from each Division.

- c. Three hours of credit for the course, Readings and Papers in Public Administration.
- d. Upon prior approval by the Registrar, credit for courses outside the Department of Public Administration may be applied when such courses are properly in line with the student's major interest.
- e. When a student has completed fifteen hours in public administration courses, he should notify the Registrar so that he may be assigned to an adviser.

#### CERTIFIED STATEMENT OF ACCOMPLISHMENT WITH HONORS

Students who complete the course requirements for the certified statement of accomplishment in public administration, undergraduate or graduate study, with an average of "B" or higher are given an opportunity to qualify for honors by passing an oral examination. The examination is given by a panel set up by the Graduate School. Students who wish to take the examination should apply to the Registrar at the completion of their programs.

### GENERAL ADMINISTRATION

#### COMMITTEE

DAVID S. BROWN (Chairman)

JOHN J. CORSON

MARTIN KRIESBERG

These courses offer a general understanding of American government and the fundamentals of public administration. In them a special emphasis is placed on the relationships of citizens and public employees.

A student who plans to take work in any of the divisions of the department will find that the specialized courses are more meaningful and useful if he has first completed the basic courses in this Division.

### 6-341. American National Government

Fall, 2 credits. Repeated in Spring and Summer

NORMAN J. SMALL

History and origins of the national Government of the United States; the political process—parties and elections; the legislative process; the functions of the national Government and their administration; courts and judicial review of legislation. Students are advised to take this course before Introduction to Public Administration.

### 6-344. Introduction to Public Administration

Fall, 3 credits. Repeated in Spring and Summer

DAVID S. BROWN  
LYNN W. ELEY

This course is designed to introduce the student to the elements of public administration. Attention will be devoted to the evolution of administrative organization; organizational types: staff, line, and auxiliary agencies and functions; controls of administration; the broadest aspects of personnel selection, classification, training, movement, and relations; budgeting and fiscal control;

federal-state relations; administrative legislation and adjudication. The object of the course is to lay a broad foundation for more intensive courses in management. *Prerequisite:* A course in American National Government.

### 6-351. Political Parties

Fall, 2 credits

CHARLES W. SMITH, JR.

The nature of political parties; the background of party division; party organization; presidential campaigns; propaganda techniques used to gain votes; the prediction of election results; sectional interests in politics; political leaders, demagogues, city machines, rural politics. *Prerequisite:* A course in American government, or at least one year of college work.

### [6-400.] Administrative Operations for Congressional Assistants (1954-55 and alternate years)

Spring, 2 credits

EVA B. ADAMS  
JEROME N. ELLER

### 6-453. Human Relations in Administration (See p. 67)

### 6-515. The Legislative Process

Fall, 3 credits

LEWIS J. LAPHAM

Information about the legislative process which will tend to facilitate effective cooperation between the personnel of the Legislative and Executive Branches. The functions of Congress; organization of Congress; consideration of bills in committees; consideration of bills on the floor; party leadership in Congress; the functions of the Executive regarding legislation; assistance by executive agencies in the legislative process; relation of non-governmental groups to legislation; legislative staff aids; congressional investigations of executive agencies as a control mechanism; correspondence, informational, and informal relations between Congress and executive agencies.

To give vitality and practical value to the subject, basic orientation lectures will be supplemented by seminar sessions, visiting experts, visual aids and planned laboratory techniques designed to provide active student participation in Congressional processes. *Prerequisite:* A course in American government, or experience in legislative-executive relationships.

### 6-545. Administrative Leadership

Spring, 3 credits

JOHN J. CORSON

A study of the role of the administrator in public administration at all levels from the division chief up. Analysis of the role, responsibilities and nature of the administrator; of his influence on the organization and the influence of the organization upon him. Consideration of authority and its use.

Consideration of the ways the administrator accomplishes his objectives including analysis of his responsibilities for planning, communication, the development of people, leadership and the maintenance of organizational equilibrium. Special attention is devoted to contrasts between public and private administration. *Prerequisite:* Principles of Scientific Management or equivalent in training or experience.

### 6-600. Readings and Papers in Public Administration

Fall, 3 credits. Repeated in Spring

JOHN H. THURSTON, Coordinator

Under the guidance of a senior administrative official, supervised readings with monthly conferences on specified topics of administration or individual research and a paper on some problem or phase of administration. Readings or problem to be investigated are determined in consultation with adviser. *Prerequisite:* Completion of all other requirements for the undergraduate or graduate certified statement of accomplishment in public administration. The course



may be taken, with the approval of the coordinator of the course, by students who are not candidates for certified statements if they have the equivalent background in public administration.

## ORGANIZATION AND MANAGEMENT

### COMMITTEE

JOSEPH P. LOFTUS (Chairman)

N. ROBERT BEAR  
HARVEY E. BECKNELL  
GERMAN S. ELLSWORTH  
WILLIAM A. GILL  
EDWARD W. HARDING

ARTHUR JEBENS  
DAVID LEVINE  
JOHNSTON E. LUTON  
HAROLD A. STONE  
JOHN D. YOUNG

These courses are offered to give students an opportunity for progressive study and advancement in the general field of organization and management. The courses use to advantage, among other background data, the instructional and case materials developed by the Bureau of the Budget and by other Governmental agencies.

### 6-405. Principles and Techniques of O & M Work

Year, 2 credits each semester

DAVID D. LEVINE and JOHN D. YOUNG

Deals with the principles and techniques employed in surveying and analyzing organization and methods problems and in formulating solutions to such problems. Emphasis on planning and conducting procedures surveys; methods and approaches in analyzing and planning organization structures including analysis of the impact of individual and group behavior on formal organization structures and authority; methods of dividing work (production planning) and controlling work flow (production control); relationship of the scientific method to O and M work; analysis of staff and line concepts and relationships including the problem of overcoming resistance to new methods and procedures. *Prerequisite:* Experience in O&M work.

### 6-450. Principles of Scientific Management

Spring, 3 credits

REED L. FRISCHKNECHT

Common functional elements of management. Definition of objective; organization; planning; coordination of execution through schedules, budgets, reports, and measurement of progress. Types of motivation. Historic management types. Types of organization. Personal relations and community relations in the several management types. Origin, nature and development of scientific management. Application of scientific management in enterprises outside of government. *Prerequisite:* Bachelor's degree; or a course in American government or public administration and a course in social science.

### 6-519. Work Standards and Work Measurement

Fall, 2 credits. Repeated in Spring

ECKHARD BENNEWITZ and BEN POSNER

A study of the most advanced techniques of scientific management concerned with development of work standards and measurement of work loads and performance, and of their adaptability in public administration. Statistical and experimental methods of determining standards. Dangers to avoid in setting standards. Time study. Standards as a dynamic part of operations, and a tool in developing policies on personnel placement and training. Standards as aids

in developing budgets, in planning operations, and in individual work planning. Importance of dependable standards, measurement and appraisal of performance to summary statements of progress for the use of higher administrative officials. *Prerequisite:* Practical working experience at Grade GS-7 or above, or permission of instructors.

### 6-540. The Application of Scientific Management in Public Enterprise

Spring, 3 credits

PHILIP C. WARD

The influence of underlying economic and social forces on organized conduct of public affairs. Major types of public agencies and basic differences between these types. Origin of purpose and policy in public enterprise. Comparison of public and private enterprise as to motivation, objectives, establishment and operation. Criteria of the quality of public administration. Application of scientific principles in the management of public enterprise, including case studies of representative organizations and operations. *Prerequisite:* Principles of Scientific Management or the equivalent.

### 6-550. Internal Organization Patterns

Fall, 3 credits

PERRY R. TAYLOR

Organization of public agencies and development of procedures for getting work done. The character of management tools in government and in private industry from point of view of middle-management and supervisors. The relations of major subdivisions to top administration and to coordinate subdivisions. Problems of coordination in a decentralized organization geographically dispersed. Importance of clear definition of responsibilities and of vertical and horizontal relations. The essence of supervision and of appropriate techniques. Coordination of activities, policies and objectives of component parts of an organization as an essential part of supervision. Establishment of standards and of procedures for measuring and appraising performance. *Prerequisite:* Principles of Scientific Management or equivalent in training or experience.

### 6-585. Establishing and Administering O & M Work

Fall, 2 credits

GERMAN S. ELLSWORTH

Deals with the problems of establishing and administering organization and methods work. Covers the way an agency gears itself to improve management to bring about efficiency and economy of operations. Includes responsibilities and authorities of an O&M unit; relationships within and without the bureau, department and the Government; scope of O&M work; control and management of survey projects; long and short term programs of work; selecting staff; gaining acceptance of recommendations. Emphasis is placed upon different sets of circumstances encountered in O&M work. Cases are presented both by students and by instructors. This course is designed for persons who wish to expand their knowledge of the administrative phases of O&M work. It is essential therefore that they have previous education or experience or both in the practical application of its techniques. *Prerequisite:* Completion of courses in the principles of O&M analysis and consent of instructor.

## FINANCIAL AND BUDGETARY ADMINISTRATION

### COMMITTEE

JOHN L. WELLS (Chairman)

CHARLES L. GRANT  
DAVID H. SPANIER

FRANK H. SPENCER  
CARL W. TILLER

Students desiring a knowledge of how the Government obtains, budgets and manages its money will find helpful some of the courses

in general administration as well as the specialized courses in this division. Those with limited experience in this field should begin their study with Federal Budgetary Procedure in the Division of Office Techniques and Operations, and the general administration courses before attempting the advanced courses in Budget Formulation and Execution.

#### **4-116. Federal Budgetary Procedure** (See p. 41)

#### **6-360. Hospital Business Administration I: Accounting, Statistics and Finance**

Fall, 2 credits

DAVID H. SPANIER

Principles of hospital fund accounting: general fund income, expense and balance sheet accounts; temporary and endowment fund accounts; plant fund accounts. Adjusting and closing entries; prepaid and deferred items; preparation of trial balances. Hospital patient and hospital service statistics. Hospital financial and statistical statements. Cash receipts and accounts receivable procedures. Cash disbursements and accounts payable procedures. Inventories. Credits and collections. Payroll and personnel procedures. Check lists of equipment and supplies; depreciation; reserves. *Prerequisite:* Principles of Accounting or the equivalent in experience.

#### **6-361. Hospital Business Administration II: Cost Analysis Methods and Budgeting**

Spring, 2 credits

DAVID H. SPANIER

Principles of hospital cost analysis methods, rate structures and budgeting. Detailed cost analysis problems, organization of accounting department, principles of internal control and food cost accounting. *Prerequisite:* Hospital Business Administration I or its equivalent in experience.

#### **6-461. Federal Hospital Administration**

Fall, 2 credits

FRED A. McNAMARA and PIERRE S. PALMER

An introductory course designed for those wishing to have a general familiarity with Federal hospital administration and for those in one of the specialized phases of hospital and health administration desiring a broad understanding of the administration of Federal hospitals. Deals with the history of hospitals in the United States; the scope and organization of the various Federal hospital programs; general principles of organization as applied to both Federal and voluntary hospitals; the functional elements of hospitals; application of modern management tools in hospital administration; management problems in such areas of hospital administration as food service administration, procurement and inventory control, personnel management, and plant management; management improvement in Federal hospitals; and problems of coordination of Federal hospital operating and construction programs. The course will be conducted through lectures and discussion periods. Guest speakers from Federal and voluntary hospitals will present several of the topics.

#### **6-525. Financial Organization and Procedures of the Federal Government**

Fall, 2 credits

CARL W. TILLER

A comprehensive summary presentation of Federal fiscal administration, presented primarily on a lecture basis, and including review of the roles of major participants: Treasury, GAO, Congressional Committees, Bureau of the



Budget, and operating departments. Designed to provide an understanding of the financial organization and procedure of the Federal Government, including such subjects as the Government fund and account structure, and its revenue structure and administration. An orientation course for persons working in some part of the area of financial administration, such as budgeting or accounting, and for general or program administrators who wish an over-all picture of the financial structure of the Government.

### 6-635. Budgetary and Financial Administration: Budget Formulation

Fall, 2 credits

JOSEPH C. WHEELER

First part of an advanced, two-semester program for experienced budget and general administrative personnel. Covers the broad phases of budgetary and financial administration in the Federal Government primarily from the standpoint of the operating department.

The course deals with the pre-appropriation phases of budgeting, including formulation, review, and congressional enactment of the budget. Topics discussed include: the role of budgeting in program formulation; the role of bureaus, departments, Bureau of the Budget, the President and Congress in budgeting; content of the budget and of departmental estimates and related budgetary materials; the investment and capital-outlay budgets; review and analysis of budget estimates; budget justification; legislative-administrative relationships in budgeting. *Prerequisite:* Bachelor's degree and an introductory course in public administration; or experience at a responsible level in budgetary, financial or general administration; or consent of instructor.

### 6-636. Budgetary and Financial Administration: Budget Execution

Spring, 2 credits

JOSEPH C. WHEELER

This is the second part of an advanced two-semester course covering the broad phases of budgetary and financial administration in the Federal Government. Several officials from bureau and department budget offices and other budgetary and financial organizations lecture and lead discussions.

This semester deals with the execution of the budget after it is enacted by Congress and the relationships of administrative planning and control, accounting, auditing, and financial reporting to budget execution. *Prerequisite:* Bachelor's degree and an introductory course in public administration; or experience at a responsible level in budgetary, financial or general administration; or consent of instructor.

## PERSONNEL ADMINISTRATION

### COMMITTEE

H. DEAN COCHRAN (Chairman)

MILDRED C. BENTON  
JAMES L. BUCKLEY  
L. M. CORRELL  
VIRGIL L. COUCH  
C. O. HENDERSON

G. E. HILBERT  
HAROLD LEICH  
ARTHUR B. McLEAN  
ROSS POLLOCK  
JOSEPH E. WINSLOW

The student is urged to take the introductory course in public administration before concentrating on the program in this division. Unless substantial experience can be substituted, the general course, Public Personnel Administration, should be taken before the specialized courses (such as Position Classification, Selection and



Placement, etc.). Persons who are in positions classified at GS-5 or below and desire to prepare for personnel work should begin with Federal Personnel Procedure in the Department of Office Techniques and Operations. They should not attempt to take the specialized courses until they have gained substantial experience in personnel work or have completed all basic, general courses.

**4-114. Federal Personnel Procedure** (See p. 41)

**4-214. Advanced Federal Personnel Procedure** (See p. 43)

**4-201. Supervision** (See p. 42)

### **6-430. Public Personnel Administration**

Fall, 2 credits. Repeated in Spring

JERRY C. DOSTER

Designed for supervisors and administrators wishing to have general familiarity with personnel work, for those in junior personnel staff positions desiring a broad understanding of personnel administration, and for those desiring to enter the field who need a foundation for the more specialized courses in the personnel field. Personnel problems which arise when people are associated together in a work situation; basic personnel policies and practices necessary and useful in treating personnel problems; differences between responsibilities, with respect to personnel administration, of the supervisor and the personnel officer; the various phases of personnel work; study of merit system and forms of organization; civil service legislation at various governmental levels; relationships between the Civil Service Commission and operating agencies and personnel offices of latter; trends in public personnel administration and its relationship to overall management. *Prerequisite:* One of the following: Introduction to Public Administration; Course 108 or 114 in the Department of Office Techniques and Operations; Grades GS-4 or above in personnel work; 60 semester hours of college work.

### **6-435. Selection and Placement**

Fall, 2 credits

RAYMOND L. RANDALL

Survey of the historical development and current thinking and practices in recruitment, selection, and placement of employees, with special reference to the Federal civil service. Emphasis in lectures and discussion is directed toward understanding basic principles which underlie policies and methods in public employment, with only incidental attention to the development of skills in such specific techniques as interviewing, examination preparation and administration, and reemployment investigation. The course is intended for students who wish to understand the "why" of public selection and placement procedures, rather than for those primarily interested in how such procedures are carried out. *Prerequisite:* One of the following: Course 344 or 430 in Public Administration; Grade GS-4 or above in personnel work; 60 semester hours of college work.

### **6-437. Psychological Tests and Measurements**

Fall, 2 credits

ALBERT MAPOU

Acquaints the student with different types of psychological tests, rating scales, interviews and other evaluation techniques and their uses in the fields of personnel administration, employee counseling, vocational guidance, and education. Useful to personnel workers, teachers, counselors, test examiners, and of general interest to the student of psychology. Topics covered: the theory of measurement; evaluation of measuring devices; use and interpretation of tests; types of aptitude, achievement and personality tests; the use of rating scales and standardized interviews. *Prerequisite:* A course in psychology and one in statistics; or experience in personnel or guidance work; or consent of the instructor.

**6-444. Position Classification**

Fall, 2 credits. Repeated in Spring and Summer

WILLIAM C. LAXTON and JOSEPH P. FINDLAY

Covers the fundamental concept of position classification and its uses; relation of classification to compensation and other phases of personnel management; analysis of Classification Act of 1949; identification, analysis and application to specific positions of factors determining class and grade levels; discussion of job evaluation techniques; and application of position classification in the Federal service including operating policies, practices and procedures. *Prerequisite:* One of the following: Courses 344 or 430 in Public Administration; Grade GS-4 or above in personnel work; 60 semester hours of college work.

**6-448. Wage Administration**

Spring, 2 credits

THOMAS T. TOWNSEND

Basic concepts of and organization for wage administration in the Federal Government; brief history of the laws, orders, regulations and decisions that affect wage rate setting and the administration of wage rates; wage policies and procedures of departments and agencies that are major employers of "blue collar" workers; impact of wage stabilization on administration of wage programs. Provision for participating in practical work assignments.

**6-453. Human Relations in Administration**

Fall, 2 credits

E. GRANT YOUMANS

The purpose of the course is to orient the student to the structure of interpersonal relations in bureaucratic organizations. The elements of the course are: the development of the sociology of administration; the rise of bureaucracies; the *Gemeinschaft* and *Gesellschaft* mentality; the social organization of private and public bureaucracies; the formal organization of management; the informal organization of workers; the structure of power and authority; work roles, positions, and status; role-taking, motivation, and morale; the social adjustment of the worker; the social skills of the supervisor and the executive.

**6-468. Contemporary Trends in Labor Relations**

Year, 2 credits each semester

FRANCIS X. MCCARTHY

Review of the history, economics, and statutes which have brought about the present labor-management relationship. Study and discussion of labor relations in certain government agencies and in several private plants. Study and discussion of various types of employer-employee problems in the Federal government. Study of the current aims of some of the larger unions and of current action by several leading industrial firms. Review of the Labor-Management Relations Act of 1947 (Taft-Hartley Law), its meaning as a trend in labor relations, its accomplishments and weaknesses. Future trends in labor-management relations. *Prerequisite:* GS-4 or above in personnel administration, O&M, or general management; or 60 semester hours of college work; or consent of the instructor.

**[6-582.] Personnel Division Management (1954-55 and alternate years)**

Fall, 2 credits

VIRGIL L. COUCH

**6-620. Administration of Training**

Fall, 2 credits

E. R. DRAHEIM

Designed to give special assistance in training administration to present or potential training officers and to administrators and supervisors who do not have the services of a training officer. Training as a tool of management; the administration of training; organizing to get training done; group dynamics—the

use of group participation and judgment in planning for and getting training done; career development—the individual's part in his own development; the supervisor's job in developing employees; application of the laws of learning to in-service training; review and demonstration of the use of some of the methods for effective training; techniques and devices to get quick acceptance of ideas; training administrators and supervisors to select and use those methods, techniques and devices which are the best for given situations; methods of evaluating training programs and techniques.

## 6-670. Executive Selection and Development

Spring, 3 credits

RAYMOND L. RANDALL

The philosophy and techniques governing the selection and development of government executives. The special problems of the government executive vis-à-vis his industrial counterpart. The following specific techniques are discussed: How to determine long-range needs for executives; how to analyze the labor market; how to select new executives from within the organization; how to identify potential executive talent at an early stage; how to develop such talent through the use of committee assignments, assistant-to positions; rotation, counseling, and special-purpose training; how to create and organize an executive reserve; how to make a replacement inventory. Case histories of industrial executive development programs are used.

Designed for those who have responsibilities for selection of broad-gauge generalists to guide the work of divisions, bureaus, or departments.

## LEGAL ADMINISTRATION

### COMMITTEE

ASHLEY SELLERS (Chairman)

THOMAS J. FLAVIN

RALPH F. KOEBEL

DAVID REICH

## 6-320. Introduction to Administrative Law and Procedure

Fall, 2 credits

EDWARD C. JOHNSON

A survey, for the general student, of the nature of administrative law, its subject matter, and methods of administration. The rule-making and adjudicative or determining procedures by federal and state regulatory agencies and the remedies against administrative action receive special consideration.

The increased complexity of modern society has meant that administrative tribunals have played an expanding role in the regulation of life and property. This course includes a study of the law which controls and the regulations which are made by governmental officers to implement that law. A survey of economic and social forces involved in regulatory action. Material used includes regulations, orders and decisions of federal, as well as state and municipal bodies, which acquaints students with current developments in administrative law and procedure. Topics covered include: powers and duties of administrative authorities as they relate to the supervision of public, as well as private interests; means of enforcing decision; remedies against official action; legal qualifications for office; legal disqualification of officers; appointment, tenure, removal and compensation of officers; and related matters.

## 6-422. Business Law

Year, 2 credits each semester \*

EDWARD C. JOHNSON

Aspects of law essential to the conduct of modern business. Forms of business organization, bailments, property, sales, mortgages, negotiable instruments, contracts. *Prerequisite:* Principles of Accounting or equivalent, or consent of instructor.

\* This course is so arranged that students may attend both semesters or either semester. No subject matter, however, will be repeated.



**6-425. Legal Aspects of Investigation—Criminal Evidence and Procedure**

Spring, 2 credits

RALPH F. KOEBEL

Designed to provide investigative personnel and those desiring to prepare for such work, a background and insight into the legal aspects of their investigations: what types of evidence to seek; circumstances and conditions under which the evidence is to be obtained in order to have adequate probative value; and how to prepare such evidence for presentation in court or other procedure. Since all investigations are potential sources of prosecution, the requirements of criminal evidence and procedure often reach into the early stages of investigation. The instruction is designed to provide understandable information without overemphasis of technical aspects.

**[6-480.] Copyright Law (1954-55 and alternate years)**

Spring, 2 credits

LOUIS C. SMITH

**6-680. Administrative Law**

Spring, 2 credits (alternate years)

THOMAS J. FLAVIN

Study of administrative tribunals; constitutional and statutory limitations on administrative discretion; requisite of a fair hearing; judicial control over administrative action. *Prerequisite:* Bachelor's degree with courses in public administration, public law, or government regulation; or experience in regulatory work; or Introduction to Administrative Law and Procedure.

**[6-820.] Problems of Federal Administrative Regulation (1954-55 and alternate years)**

Spring, 2 credits

THOMAS J. FLAVIN

**PROCUREMENT AND PROPERTY MANAGEMENT****COMMITTEE**

JOHN B. HOLDEN (Chairman)

CLIFTON E. MACK

S. A. SNYDER

FRANCIS R. MANGHAM

FRANK H. SPENCER

JAMES SCAMMAHORN

RAY WARD

Courses in this field deal with how the Government purchases, manages and accounts for materials and supplies. Those interested in purchasing but with limited experience in such work will find it helpful to begin with the courses in Federal Purchasing Procedure and Federal Property Procedure before attempting the management courses.

Selected background courses in public administration together with courses in the Division of Organization and Management will provide a thorough training in administration in this area.

**4-113. Federal Property Procedure** (See p. 41)**4-115. Federal Purchasing Procedure** (See p. 41)**8-405. Principles of Specifications** (See p. 95)



## 6-455. Management of Governmental Supply

Spring, 2 credits

JOHN B. HOLDEN

An advanced course covering the broad phases of handling and managing Government supply activities. Deals with supply policies, organization and management, finances, and laws governing supply. Topics: (1) organization and management of purchasing offices; (2) organization and management of warehouses; (3) property accounting, management and distribution of supplies and equipment; (4) management and training of purchasing and warehousing personnel; (5) procurement function efficiency determination and importance of project service objective and its relation to good Government purchasing and warehousing; (6) decisions of the Comptroller General and regulations affecting procurement; (7) nature of public contracts as compared with private contracts; (8) Federal Specifications and specification studies, including development and writing; (9) delivery requirements, inspection of supplies and liquidated damages; (10) market analysis and conditions which affect seasonal project work of Government bureaus; (11) laws which affect procurement contracts such as Walsh-Healey Act, Davis-Bacon Act, Eight-Hour Law; (12) functions of General Accounting Office, Federal Supply Service, Federal Prisons Industries and surplus disposal agencies in the supply scheme; (13) traffic problems and transportation studies on methods of shipment; (14) new developments in procedures affecting supply and dissemination of information to field supply units. *Prerequisite:* One of the following: Introduction to Public Administration; Federal Purchasing Procedure; Federal Property Procedure; Grade GS-4 or above in purchasing work; 60 semester hours of college work.

## 6-638. Government Defense Contracts

Fall, 2 credits

JULIUS SILVERSTEIN

Laws and problems in defense contracting by the Federal Government, including such subjects as cost-plus contracts, contingent fees, priorities, subcontracting, escalation, financing, renegotiation, contract termination, and surplus property.

### ACCOUNTING

#### COMMITTEE

JOHN C. COOPER (Chairman)

PAUL L. APPLEMAN  
KARNEY A. BRASFIELD  
WARNER H. HORD

LAWRENCE O. MANLEY  
CHARLES N. MASON  
ROBERT W. MAXWELL

HERSCHEL C. WALLING

The Graduate School offers accounting courses primarily as a means of training for the *public* service. The curriculum necessarily includes courses in general accounting because the basic principles are essential for Government accounting.

#### CERTIFIED STATEMENT OF ACCOMPLISHMENT IN ACCOUNTING

The scope of accounting in the Federal service is wide. There are increasing demands for accountants having a knowledge of commercial as well as Government accounting. These demands have come as a result of the formation of many Government corporations and Federal regulatory agencies. Hence, the accounting program required for a Certified Statement of Accomplishment is broad enough to cover not only the regular appropriation accounting of

the Federal Government, but also the accounting training needed for many other governmental activities. The program is comprehensive enough both to provide advanced training for the Government service, and also, if courses are carefully selected, to meet the usual educational requirements for C.P.A. examinations. Students planning to take C.P.A. examinations should know the requirements of the state in which they plan to take the examination. In general, their study, in addition to accounting, should include the following: Principles of Economics, Corporation Finance, Investments, Mathematics of Accounting and Investment, Business Law, Statistics, Business English, Principles of Marketing and Industrial Management.

#### *Requirements for Certified Statement*

1. High school diploma or equivalent.
2. Thirty-six semester hours of credit with grades of "C" or better in courses outlined below and distributed as follows:
  - a. All of the required courses.
  - b. No less than three semester hours credit from the Accounting Elective Courses.
  - c. No less than six semester hours credit from the Related Elective Courses.
  - d. The remaining six semester hours credit may be taken in either of the two elective groups.

#### REQUIRED COURSES

<i>Courses</i>	<i>Number of Semesters</i>	<i>Semester Hours Credit</i>
Principles of Accounting .....	2	6
Intermediate Accounting .....	2	6
Cost Accounting .....	1	3
Auditing .....	2	4
Advanced Accounting .....	1	3

#### ACCOUNTING ELECTIVE COURSES

Federal Government Accounting .....	1	3
Federal Tax Accounting .....	1	3
Analysis and Interpretation of Financial Statements .....	1	2
Mathematics of Accounting and Investment .....	1	3
Federal Accounting Procedure .....	1	3
Federal Auditing Procedure .....	1	2
or Advanced Federal Auditing Procedure .....	1	2
Budgetary and Financial Administration .....	2	4
Advanced Accounting Problems .....	2	6
Accounting Systems .....	1	2
Cost Accounting (Second Semester) .....	1	3

#### RELATED ELECTIVE COURSES

Business Law .....	2	4
Principles of Economics .....	2	6
Principles of Statistical Analysis .....	2	6
Writing Procedures and Instructions .....	1	2
or Introduction to Official Writing .....	1	2

**6-352<sup>a</sup>. Principles of Accounting—First Half**

Fall, 3 credits. Repeated in Spring and Summer

HERBERT G. MARSHALL  
WILLIAM H. ROWE  
STANCIL M. SMITH

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to do the accounting necessary for a small business organization; i.e., keep a complete set of books, draw up statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books. *Prerequisite:* High school graduation or equivalent.

**6-352<sup>b</sup>. Principles of Accounting—Second Half**

Spring, 3 credits. Repeated in Summer

HERBERT G. MARSHALL  
WILLIAM H. ROWE  
STANCIL M. SMITH

Continuation of first half covering more advanced principles of accounting; accounting for partnerships, corporations and manufacturing; depreciation policies and analysis of financial statements. *Prerequisite:* First half or equivalent.

**6-353<sup>a</sup>. Intermediate Accounting—First Half**

Fall, 3 credits. Repeated in Spring

BERNARD T. DODDER  
WARNER H. HORD

Advanced principles of manufacturing accounting, corporation accounting, and valuation as applied to current assets, fixed assets, intangibles, and liabilities, reserves and funds, installment sales. *Prerequisite:* A first year course in accounting.

**6-353<sup>b</sup>. Intermediate Accounting—Second Half**

Spring, 3 credits. Repeated in Fall

BERNARD T. DODDER  
WARNER H. HORD

Advanced principles of partnership accounting, including formation, operation, and dissolution; joint ventures; consignments; agencies and branches; application of funds. *Prerequisite:* First half or equivalent.

**6-354. Federal Government Accounting**

Fall, 3 credits. Repeated in Spring

CHARLES N. MASON

A review of the development of the accounting system for Federal funds and the present financial organization in which the accounting is performed with attention to the accounting responsibilities of each segment of the organization, including the Treasury Department and the General Accounting Office. Detailed study is given to the accounting problems of administrative agencies with special emphasis on the principles of controls, financial reporting problems, and recent developments in accounting in the Federal government. *Prerequisite:* Two years of Commercial Accounting, or Federal Accounting Procedure and one year of Principles of Accounting or the equivalent.

**6-360. Hospital Business Administration I: Accounting, Statistics and Finance**

(See p. 64)

**6-361. Hospital Business Administration II: Cost Analysis Methods and Budgeting**

(See p. 64)

**6-420. Advanced Accounting**

Fall, 3 credits

LAURENCE W. ACKER

Advanced principles of accounting, consolidated statements; foreign exchange; receivership; estates and trusts; budgets; public accounts. *Prerequisite:* Intermediate Accounting or equivalent.

**6-423. Mathematics of Accounting and Investment**

Spring, 3 credits

RALPH R. BOTTS

Calculation of compound interest, compound discount, sum of annuities, present value of annuities and perpetuities; accumulation of sinking funds and amortization of debts by installments. Calculation of bond yields, bond values, premiums and discounts. Computation of depreciation by sinking fund method and fixed percentage of book value method. Some study is given to life probabilities and the computation of premiums and reserves for the more common types of life insurance and annuities. Accounting applications and entries will be discussed for those students interested in the accounting aspects.

**6-510. Analysis and Interpretation of Financial Statements**

Spring, 2 credits

LAURENCE W. ACKER

Study of the flow or movement of funds as reflected in the financial statements. Use of ratios and other indices in the analysis and interpretation of financial position together with a consideration of trends and variations therein. Subject matter is developed through lectures and problems, supplemented with published financial statements. Each student prepares, under supervision of the instructor, an analysis of the current financial statements of some prominent corporation together with a comparison with the principal competitors in the field. *Prerequisite:* Intermediate Accounting.

**6-642. Cost Accounting**

Year, 3 credits each semester (alternate years)

BERNARD T. DODDER

A thorough and comprehensive treatment of the principles of cost accounting, together with the methods of their application to specific problems. By means of lectures, textbook study, and problems, full consideration is given to the methods of cost accounting for materials, labor, direct and indirect expenses in their relationship to specific job orders; process, departmental and standard costs; and the control accounts. *Prerequisite:* Principles of Accounting.

**6-645. Federal Tax Accounting**

Fall, 3 credits

EUGENE C. MOYER

Federal taxation presented from the accounting viewpoint. Special attention given to income taxation. *Prerequisite:* Principles of Accounting; accounting experience desirable.

**[6-646.] Advanced Accounting Problems (1954-55 and alternate years)**

Year, 3 credits each semester

LAURENCE W. ACKER

**6-693. Auditing**

Year, 2 credits each semester

JOHN C. COOPER

The fall semester is devoted to the study of the fundamental principles of public or commercial-type audits. Consideration is given to the purposes and types of audits; the responsibility of the auditor; planning and performing audits. Special emphasis is placed on problems in audit theory and practice such as are generally given in C.P.A. examinations.



In the spring semester, emphasis is placed on case studies in auditing and the application of audit principles. Special consideration is given to the field of internal audit as a tool of management and the utilization of internal audit in Government. *Prerequisite:* Intermediate Accounting.

### **6-694. Specialized Federal Accounting Systems**

Fall, 3 credits

EDWIN T. NOLAN and SPECIALISTS

Designed to acquaint the students with the basic principles and standards of systems design and with current developments and improvements in Federal accounting. The systems of a diversified group of Federal agencies are used as case studies. *Prerequisite:* Intermediate Accounting, Federal Government Accounting, and Cost Accounting, or the equivalent.

### **[6-695.] Accounting Systems (1954-55 and alternate years)**

Spring, 2 credits

EDWIN T. NOLAN

# Social Sciences

## DEPARTMENTAL COMMITTEE

SHERMAN E. JOHNSON (Chairman)

BUSHROD W. ALLIN  
H. DUNCAN HALL  
PAUL E. NYSTROM  
HAROLD B. ROWE

CARL C. TAYLOR  
JAMES E. THIGPEN  
HARRY C. TRELOGAN (Vice-chairman)  
FREDERICK V. WAUGH

## PURPOSE AND SCOPE

Social science deals with people and the problems of human relationships, as contrasted with natural or physical science which deals with things and the problems arising out of physical relationships.

The problems of social organization and operation have become both absolutely and relatively more important with the increase in complexity of our industrial civilization. More and more, people are concerned with the organization of production, the distribution of goods and income, and with price policies. The individual as a consumer and investor, the businessman and the farmer as producers, find increasing need for a knowledge of economics and other social sciences. Large corporations are employing growing numbers of economists to help in the formulation of policy. Psychologists and social workers are finding a demand for their services in personnel work. And, the large number of Federal, state and local government agencies need more people adequately trained in social science.

Social science is divided into a number of closely allied fields including economics, sociology, political science, history, law, and psychology. A broad grasp of any one of these subjects implies at least some familiarity with the others, because of the many interrelationships among these studies. Yet the continued development of each social science has given rise to larger and still larger bodies of knowledge relating to it, until only through a considerable degree of specialization can the student hope to master any one part. Thus the great need is for people who have concentrated sufficiently on one phase of a social science, such as marketing in economics, to be thoroughly familiar with the details of fact and principles involved, yet who also have a broad underlying training in the allied fields.

The courses offered by the Graduate School are designed to aid in acquiring a general background in the social sciences, as well as the specialized training in particular fields which is necessary for successful work in many Government departments and in private business.

## SUGGESTIONS FOR PROGRAM OF STUDY

To meet the specific needs of students who have different educational and experience backgrounds and different immediate interests, the Graduate School has developed the following types of courses in the social sciences:

(1) *Courses of General Interest.* Several of the social science courses are designed to provide information of general interest to a large group of persons who do not expect to become specialists in a particular field, but who desire to obtain some background in a subject, as a basis for work in related fields, or purely as a personal interest. An employee in the personnel office of a Department of Agriculture branch responsible for market news and inspection services may wish to take a course in marketing in order to learn something about the subject matter dealt with by the personnel of the branch, or a course in psychology as an aid in dealing with the personal problems which are daily presented to employee counselors. The secretary to an economic research director may want a course in the principles of economics in order to become familiar with the terminology and general economic concepts to which her stenographic and filing duties relate. An almost unending array of job needs of this kind offers opportunities to the alert and ambitious employee to increase his capacity and usefulness to his employer. The many promotions within the Government service which can be traced directly to such training testify to the fact that study in the social sciences is profitable.

These courses of general interest are at the undergraduate level, such as Introductory Survey of Economics, Introduction to the Study of Human Relations, Introduction to Marketing, and General Psychology.

(2) *Undergraduate Basic Courses.* These courses are designed to provide a basic social science background for students who have not completed their undergraduate training or who have not had an opportunity to take the basic background work in economics and the other social sciences as a part of their qualification for Bachelor's degree work. These courses provide an opportunity for persons who enter the Government service in the lower grades to prepare themselves for professional advancement.

(3) *Graduate and Advanced Undergraduate Courses.* These courses offer work of graduate level but they are also open to undergraduates of advanced standing. Students who are registered for graduate credit will be expected to do more work in these courses than those who register for undergraduate credit.

(4) *Strictly Graduate Courses.* These courses are offered only for graduate students who have adequate background. They are

usually conducted on a seminar basis and they require a great deal of participation and preparation of material by the students themselves.

Students working for graduate degrees should consult educational advisers in the institution where they expect to receive their degree. If they have not selected such an institution they should confer with advisers in the Graduate School who are teaching in the particular field in which they expect to concentrate. In general, students who wish to map out a course of study leading toward a graduate degree should plan their work to include:

- (1) Completion of basic undergraduate courses.
- (2) Advanced courses in social science fields related to the particular field of concentration. For example, a student majoring in economics should consider advanced courses in statistics, economic history, sociology or some other related field in order to broaden his educational background.
- (3) Advanced courses in the field of concentration. Students who expect to major in one of the social science fields should begin their graduate work by taking the basic graduate courses in that special field. For example, students who expect to major in any field of economics should plan to take at least six credits of work in advanced economic theory and six credits in monetary and cycle theories. With these courses as a foundation, the student can begin to specialize in courses in his particular field of concentration.



## GENERAL ECONOMICS

### COMMITTEE

BUSHROD W. ALLIN (Chairman)

ROY J. BURROUGHS  
JAMES P. CAVIN

JOHN CORDON DAVIS  
ROBERT N. GROSSE

HOWARD S. PIQUET

Adequate foundation training in general economics is essential for satisfactory accomplishment in the study of any specialized branch of the subject. Hence, the primary objective in developing the following list of courses has been that of providing the basic work needed, by students who wish to carry out a systematic plan of study, at both undergraduate and graduate levels. In addition, a course on research methods is listed under this head. It is of general interest to students majoring in economics.

### 7-110. Introduction to Economics

Fall, 2 credits. Repeated in Spring and Summer

GERALD M. FRANCIS

This course is designed to interpret modern economic life in terms of its characteristics as they have evolved during the last two centuries. Whether one



considers the activities and problems of individuals as consumers, as employees, as small enterprisers, or as citizens in a democracy, understanding of the current economic order rests upon a background of how it came to be. The student will become acquainted with the scope of economic study, its relation to other fields such as engineering, law, sociology, the meaning of economic "problems," the processes of a free enterprise economy, what economic institutions are, and the steps by which the present economy grew. The lectures and discussions should benefit those who desire to get acquainted with the flow of economic ideas and institutions from the mid-18th century to the present. It is especially adapted for those who may later decide to elect the course in Principles of Economics, as well as for those who feel a need for more knowledge of the modern economic environment.

## 7-201. Principles of Economics

Year, 3 credits each semester

ROY J. BURROUGHS and BUSHROD W. ALLIN

A basic course designed to equip the student with the simpler tools of economic analysis and with an understanding of the more important institutions of the economic system. Economic analysis is developed with respect to operations of the price system, behavior of individual consumers and business firms, and also the behavior of the total economy including the allocation of resources, the distribution of the total product to the factors of production and the conditions which favor high employment and a large national income. *Prerequisite:* A year of college work or its equivalent.

## 7-418. Public Finance and Taxation

Spring, 2 credits (alternate years)

TYLER F. HAYGOOD

A study of governmental fiscal policy. Current developments, problems, and controversies. Analysis of tax systems, government spending, and public debt management, and their economic effect. Study of specific federal, state, and local taxes. *Prerequisite:* A course in economics.

## [7-480.] Money and Banking (1954-55 and alternate years)

Year, 2 credits each semester

RICHARD A. RADFORD

## 7-548. Economic Analysis

Year, 2 credits each semester

ROBERT N. GROSSE

The course is concerned with methods of economic analysis. Emphasis is placed upon the exposition and evaluation of theoretical models explaining the relationships among various sectors of the economic system. Empirical applications of these tools of analysis are studied. The first semester is primarily concerned with analyses of the behavior of firms, households, and industries. The theories of demand, production, distribution, and price are studied intensively, including systems of both partial and general interdependence. The second semester is primarily concerned with analyses of the behavior of economic aggregates. The theories of employment, national income, and economic development are studied, with particular attention to the contributions initiated by Lord Keynes. *Prerequisite:* A course in the principles of economics.

## 7-615. Interindustry Economics

Fall, 2 credits

EZRA GLASER

The economic model as an analytical concept. Theoretical antecedents, simple Leontief scheme, more general models. Open and closed models. Choice and non-choice models. Basic tables. Inverse matrix of coefficients, its simple mathematical properties and economic meaning. Practical attempts to construct economic models with actual statistical data. Contribution of model building to economic theory and analysis. Assumptions behind the approach critically examined. Application to economic problems. Limitations: statistical and economic. Primarily a course for economists, with mathematics introduced as necessary. *Prerequisite:* An undergraduate major or equivalent in mathematics or economics; or a graduate course in economic theory.

**7-705. History of Economic Thought**

Fall, 3 credits (alternate years)

MAX J. WASSERMAN

The economic theories of the most important schools and economists from Greek antiquity through Alfred Marshall (1895). The schools covered are the Greek, Medieval Period, Mercantilism, Physiocrats, the Classical School, Socialism of 1848, Historical School, Psychological School and the Neo-Classical School. The theories studied are projected against the factual and philosophical background of the period. *Prerequisite:* Principles of Economics or equivalent.

**7-706. Modern Economic Thought**

Spring, 3 credits

BUSHROD W. ALLIN and JAMES P. CAVIN

A review of the ideas of the leading economic theorists of the past fifty years, including those of Marshall, Veblen, Commons, Mitchell and Keynes. *Prerequisite:* Principles of Economics or equivalent.

**7-712. Research Methods in Social Sciences**

Spring, 2 credits (alternate years)

O. C. STINE and SPECIALISTS

This seminar considers scientific methods appropriate for the social sciences, with special attention to economics, then considers application of scientific methods to research in marketing, with some special attention to pricing and price level. *Prerequisite:* Training equivalent to that required for a Bachelor's degree, including basic elementary training in statistics and economics.

**7-728. International Financial and Trade Policies**

Fall, 2 credits (alternate years)

GRAEME S. DORRANCE

A review of the main considerations leading to the adoption of different international trade and financial policies. Primary attention will be given to a critical review of the policies adopted by a number of countries since 1945. Tariffs and other import restrictions, commodity agreements and government trading, exchange controls and currency areas, and devaluations and multiple exchange rates will be among the subjects discussed.

**AGRICULTURAL ECONOMICS**

## COMMITTEE

BENNETT S. WHITE (Chairman)

PHILIP F. AYLESWORTH  
FLOYD E. DAVIS  
HORACE R. JOSEPHSON

H. M. SOUTHWORTH  
ROBERT M. WALSH  
EVERETT C. WEITZELL

The great importance of enlarging and improving knowledge of the economics of agriculture is generally recognized. Constructive accomplishment in this field requires thorough training in economics combined with a comprehensive grasp of its application to the special conditions of agriculture. Such a balanced combination can best be achieved by following a systematic course of study appropriate to the particular area of concentration desired. The courses offered by the Graduate School permit students to carry out such plans of study with concentration in the economics of agricultural production, agricultural finance, prices, and marketing. The electives and general interest courses provided also permit the adaptation of study plans to meet the special interests of individual students.

Shortage of well-trained marketing personnel, at both Federal and State levels, critically handicaps developing a well-rounded program under the Agricultural Research and Marketing Act. The greatest immediate need is for men with advanced training who can undertake independent work in new fields. The broad expansion of activities scheduled under the Act also will continue and intensify the need for adequately prepared college graduates. On both problems the Department of Agriculture is cooperating closely with land-grant institutions. Joint committees have analyzed and mapped out attack on these problems. As part of this plan the Graduate School has given special advanced training to Washington personnel engaged in marketing work, and regularly offers both introductory and advanced courses in this field.

#### CERTIFIED STATEMENT OF ACCOMPLISHMENT IN AGRICULTURAL ECONOMICS

The Graduate School offers a Certified Statement of Accomplishment to students who have completed 30 credits of graduate work in agricultural economics, including the basic graduate courses in economics. To qualify, it is necessary to follow the specific sequence of courses that are listed for three fields of concentration indicated below.

The Certified Statement of Accomplishment is not an advanced degree, but it constitutes evidence of completion of an organized course of study in the field of agricultural economics. It is a certification that the student has completed a program of study which prepares him for effective public service in agricultural economics work.

#### COURSES LEADING TO CERTIFIED STATEMENT OF ACCOMPLISHMENT IN AGRICULTURAL ECONOMICS

##### *(With Concentration in Specified Fields of Application)*

##### BASIC UNDERGRADUATE COURSES

Required foundation courses. Carry undergraduate credit only and may not be used to meet the credit hour requirement for the certified statement. Equivalent courses will be accepted by transcript from other institutions.

The number in parenthesis after course title indicates semester hour credits.

<i>Economics of Production</i>	<i>Agricultural Finance</i>	<i>Prices and Marketing</i>
Principles of Economics (6)	Principles of Economics (6)	Principles of Economics (6)
Principles of Statistical Analysis (6)	Principles of Statistical Analysis (6)	Principles of Statistical Analysis (6)
Economics of Farm Production (3)	Economics of Farm Production (3)	Economics of Farm Production (3)
Introduction to Marketing (3)	Introduction to Marketing (3)	Introduction to Marketing (3)

##### REQUIRED BASIC GRADUATE COURSES

Economic Analysis (4)	Economic Analysis (4)	Economic Analysis (4)
Money and Banking (4)	Money and Banking (4)	Money and Banking (4)

## REQUIRED SPECIALIZED GRADUATE COURSES

Farm Management (2) or Land Economics (3)	Agricultural Finance (3)	Economics of Marketing (4)
Agricultural Policies (2)	Farm Management (2) or Land Economics (3)	
Economics of Production (3)	Agricultural Finance (3)	Agricultural Policies (2) Marketing Seminar (2)

## ELECTIVE GRADUATE COURSES

Select courses in consultation with Graduate School advisers to complete the 30 graduate credits required for certified statement of accomplishment.

**7-203. Introduction to Marketing**

Fall, 3 credits (alternate years)

BENNETT S. WHITE

A preliminary course intended to provide orientation for the study of marketing as (1) a type of production which supplies essential services, and (2) a valuation process in which the prices of agricultural commodities are established. Marketing machinery costs, functions, methods and practices are surveyed. Marketing specialists of the Department of Agriculture will lead discussions relating to particular commodities and special problems. *Prerequisite:* Principles of Economics or the equivalent.

**[7-207.] Economics of Farm Production (1954-55 and alternate years)**

Fall, 3 credits

KENNETH L. BACHMAN  
RUSSELL W. BIERMAN

**[7-409.] Farm Management (1954-55 and alternate years)**

Spring, 2 credits

WYLLIE D. GOODSELL

**[7-410.] Land Economics (1954-55 and alternate years)**

Fall, 3 credits

V. WEBSTER JOHNSON

**7-411. Agricultural Finance**

Fall, 3 credits (alternate years)

DONALD C. HORTON

Influence of the economic characteristics of different types of farms on their capital requirements; sources of agricultural capital—operator, landlord, and creditor investment; complementary and competitive relationships among farm credit institutions and other sources of agricultural capital; problems of institutions extending credit to agriculture; application of general principles of financial management to the farm business. *Prerequisite:* Economics of Farm Production or a course in Money and Banking.

**7-412. Risk and Insurance**

Spring, 3 credits (alternate years)

DONALD C. HORTON and RALPH R. BOTTS

Review of the economic theory of risk with particular consideration to the risk problems encountered in farm production; analysis of present methods of risk-bearing, including several types of public and private insurance; appraisal of suggested method of covering the economic risks encountered in farming. *Prerequisite:* Economics of Farm Production, or equivalent.

**[7-414.] Economics of Marketing (1954-55 and alternate years)**

Year, 2 credits each semester

H. M. SOUTHWORTH and HARRY C. TRELOGAN



**7-416. Agricultural Cooperation**

Spring, 3 credits (alternate years)

MARTIN A. ABRAHAMSEN and STAFF

Covers basic principles of agricultural cooperation and provides understanding of the application of these principles in every-day operation of cooperatives. Attention also is given to: (1) development of agricultural cooperation in the United States and foreign countries; (2) place of cooperation in modern society, giving consideration to the application of basic economic concepts; (3) operating practices, including management, membership and public relations, financing, integration in manufacturing, and sales and distribution; (4) legal and organizational problems; and (5) appraisal of possibilities and limitation of cooperatives. *Prerequisite:* A course in economics.

**7-461. Transportation Rates and Rate Determination**

Fall, 2 credits

ABBEFORD S. DOLCH

The course is designed to give the basis for a general understanding of the use of traffic documents, commodity classifications, tariffs and traffic publications for the several forms of transportation, and a knowledge of rate principles and history of major rate adjustments. *Prerequisite:* Some general experience with rates and tariffs.

**7-462. Traffic Management**

Spring, 2 credits

JAMES F. PERRIN

Designed to acquaint transportation students with the principles and practices of traffic management from both Governmental and commercial points of view. Emphasis on functions of a traffic department, both industrial and Governmental, and on relations between carriers and traffic departments, with a considerable portion of the emphasis placed on transportation law. *Prerequisite:* Transportation Rates, or experience with rates and tariffs, or permission of instructor.

**7-468. Current Transportation Problems**

Fall, 3 credits (alternate years)

DONALD C. LEAVENS

Current policies and practical problems in transportation, including the theory and technique of regulation and economic, legislative and administrative factors requiring consideration in dealing with transportation problems. Historical background of the present transportation situation. Influence of transportation facilities, services, and costs on the extent and nature of economic development of production areas and on the location of commercial centers for processing and storage operations; agricultural and non-agricultural products and rate-making; current problems of rail, truck and water competition; regulated versus unregulated motor carriers; and the effect of recent rapid increases in transportation costs on sources of supply, market areas, and consumers. Primarily, a general course in economics of transportation, with some special attention to agriculture. *Prerequisite:* A course in principles of economics and a basic course in economic theory, agricultural economics, or marketing.

**7-530. Methods of Price Analysis**

Year, 2 credits each semester (alternate years)

RICHARD J. FOOTE and ROBERT M. WALSH

A survey of the main price problems in agriculture and in marketing and consumption of farm products; a critical analysis of recent developments in economic theory and in statistical techniques and their use to measure the effects

of various factors influencing prices; and a study of the accuracy and usefulness of price forecasts. Attention is given to Government price, production and marketing programs and to trade practices and market organization as they affect the prices of farm products at various stages in the marketing process. Emphasis is placed on developing proficiency in application of price analysis methods. *Prerequisite:* Principles of Economics, and a course in statistics which included correlation analysis.

### **7-716. Agricultural Policies and Programs—Seminar**

Fall, 2 credits

WALTER W. WILCOX and SPECIALISTS

Analysis and evaluation of current agricultural policy and programs with special emphasis on an evaluation of these programs in terms of economic principles, defense considerations and the dynamic forces in our national economy at the present time. *Prerequisite:* An advanced degree in agriculture or a related field, or broad staff or operational responsibility in an agricultural program.

### **7-719. Resource Utilization Problems and Policies**

Fall, 2 credits (alternate years)

V. WEBSTER JOHNSON and HORACE R. JOSEPHSON

A seminar in conditions, problems, and public policies in the utilization and conservation of natural resources, with particular reference to current policies and programs. Discussions cover agriculture, grazing, forests, water resources, strategic minerals, and other important natural resources. Integrated topics include river basin development, utilization of tropical resources, population in relation to resources, and similar subjects. *Prerequisite:* Graduate work in related areas, or experience as approved by instructors.

### **[7-720.] Economics of Production—Seminar (1954-55 and alternate years)**

Spring, 2 credits

SHERMAN E. JOHNSON

### **7-721. Agricultural Finance—Seminar**

Spring, 3 credits (alternate years) NORMAN J. WALL and RUSSELL C. ENGBERG

A seminar dealing with the policies, programs and functions of private, quasi-public and public credit agencies; appraisal how adequately credit needs are being met; new developments in financing agricultural production and marketing. *Prerequisite:* Background of graduate work and approval of instructor.

### **7-722. Marketing—Seminar**

Spring, 2 credits (alternate years)

HARRY C. TRELOGAN

A seminar for advanced students interested in current research and service developments. Selected projects are reviewed to indicate newer research techniques and service methods used in agricultural marketing. Projects are examined in terms of background need for the work, objectives of the activities, and relationships to other phases of a general program of marketing research. Economic, statistical and management problems involving market costs, quality, organization and information are featured in the material selected for analytical review. A term paper on a related topic will be required for credit. *Prerequisite:* Courses in elementary economics and statistics plus advanced courses or responsible experience in marketing.

### **[7-750.] Farm Price Policy (1945-55 and alternate years)**

Fall, 2 credits

ORIS V. WELLS

## COOPERATIVE EXTENSION EDUCATION

### COMMITTEE

MARY L. COLLINGS (Chairman)

ROY BECK

D. BARTON DELOACH

CANNON C. HEARNE

BARNARD JOY

C. C. LANG

JOSEPH L. MATTHEWS

PAUL E. NYSTROM

MARY A. ROKAHR

Cooperative extension education consists of the off-campus, non-resident teaching service of the land-grant institutions in cooperation with the USDA and the leadership of a county. It is the largest non-school educational program in the United States. The growing interest on the part of county agents, supervisors, specialists, and administrators in cooperative extension work as a profession has led the Graduate School to appoint a committee on Cooperative Extension Education. This committee has the responsibility for giving guidance to students toward a program best suited to the individual's needs, within the framework of the Graduate School. This program may well lead to an advanced degree depending upon the plans of the student and the cooperative arrangements available through the Graduate School.

The following courses will be given as the demand justifies:

### **7-450. Principles and Techniques of Extension Teaching**

Fall, 2 credits

GLADYS GALLUP and OTHERS

This course is designed primarily for experienced extension workers. The principles, methods, and techniques of education will be applied to educational programs in government. The relative influence of teaching methods will be studied from the point of view of reaching and teaching more people.

### **7-451. Extension Education for Foreign Students**

Schedule to be announced. 3 credits

FREDERICK P. FRUTCHEY

A foundation course designed to give foreign students a broad introduction to extension work, its basic philosophy, principles of teaching, organizational framework, and current developments. Includes analysis of economic, social, cultural, and psychological factors that influence the results of extension programs and the methods and procedures used by extension workers to reach farm people.

### **7-535. Basic Evaluation, Research Methods and Techniques**

Fall, 2 credits

LAUREL K. SABROSKY and OTHERS

Evaluation, clarification of objectives, techniques that any government worker engaged in an educational program might use in measurement, sampling procedures, analysis, interpretation, presentation, and use of data. It is not the intention to make a "studies expert" of each student, but to give a broad concept of methods of systematically appraising work and programs.

### **7-595. Four-H Club Organization and Procedures**

Spring, 2 credits

Staff—Divisions of Field Coordination and Field  
Studies and Training, Extension Service

Specially designed for county and other extension youth workers, this course stresses 4-H Club objectives and the principles and operational aspects of planning and conducting effective youth programs. It includes lectures, demonstrations, discussions, and field experience.

**7-596. Development of County Programs**

Spring, 2 credits

J. L. MATTHEWS and CANNON C. HEARNE

A systematic study of methods of developing voluntary county educational programs, including sources of essential basic information; the role of lay people and of supervisors, specialists, and county workers; use of planning committees; step-by-step procedures; coordinated county plans; and characteristics of good programs. Special reference will be made to Extension programs, but principles and procedures are applicable to all voluntary educational programs.

**7-620. Administration and Supervision**

Schedule to be announced. 2 credits

MEREDITH C. WILSON and OTHERS

Objectives, principles, methods, and techniques of administration and supervision applied to the Cooperative Extension Service. The course is designed for experienced extension workers.

**7-695. Problems in Cooperative Extension Education**

Schedule to be announced. Credits to be arranged

Staff—Division of Field Studies and  
Training, Extension Service

An opportunity will be offered to qualified, experienced extension workers who desire to undertake a study of a problem in cooperative extension education. The amount of credit, to be determined by a committee, will be based upon the nature of the problem, amount of work, and quality of the study.

**HUMAN RELATIONS****COMMITTEE**

CARL C. TAYLOR (Chairman)

GEORGE W. ALBEE

FORREST E. CLEMENTS

JOHN M. BREWSTER

MARGARET J. HAGOOD

CONRAD F. TAEUBER

Courses in human relations are planned to meet the needs of four types of students: (1) those who wish a general rather than specialized knowledge of social problems and processes; (2) those who wish substantial first undergraduate courses in sociology, anthropology, and psychology; (3) those who wish specialized undergraduate and graduate courses in these same fields; and (4) mature persons who wish courses which use the knowledge of all social sciences in considering public issues and policy.

Introduction to the Study of Human Relations is designed to meet the needs of the first of these types of students. The American Tradition is representative of courses designed to meet the needs of the fourth class of students. Most of the other courses are standard college undergraduate and graduate courses in their respective fields.

Undergraduate students who have not had general orientation in the field of sociological sciences should enroll in Introduction to the Study of Human Relations so that, during the progress of the course, they may decide which of the specialized subject matter



fields they care to pursue further. Most of the first courses in specialized fields of psychology, sociology, and anthropology are so placed as to give students who take this basic course the opportunity to pursue their specialized interests in a following semester.

### **7-055. Point 4 and Contemporary National Cultures**

Fall and Spring (non-credit)

M. L. WILSON and CARL C. TAYLOR

A seminar designed to define different national cultures and to discuss how such knowledge is basic to effective bilateral and multilateral cooperation, with special attention to underdeveloped areas. The seminar is related to a lecture series (special lecture announcements will be issued) under the same title; visiting lecturers lead some discussions. Other sessions use the case method in analysis and discussion of current problems of program planning and administration, particularly in the technical assistance program.

Attendance at the seminar is by invitation and is limited to persons involved in program planning, policy making and administration of governmental and private programs. Registration is not required and no fees are charged.

### **7-105. Introduction to the Study of Human Relations**

Fall, 2 credits. Repeated in Spring and Summer Instructor to be announced

A study of the contributions of the various social sciences, but especially sociology, psychology and anthropology, to an understanding of human behavior. An integrative course for students who have not had an opportunity to study any of the sociological sciences. Designed to acquaint students with techniques and principles used in describing and analyzing human relations. Should not be taken by students academically prepared to do advanced work in this field.

### **7-210. General Psychology**

Fall, 3 credits. Repeated in Spring

GEORGE W. ALBEE

A study of the basic patterns of human behavior, instincts, habits, ideas and attitudes. The course begins with a thoroughgoing analysis of the human nervous system and concludes with an analysis of personality. A non-laboratory course.

### **7-215. General Sociology**

Spring, 3 credits

E. GRANT YOUMANS

A basic and general study of social problems and processes with special emphasis upon such problems as population, race, poverty, crime, divorce, etc., and group processes such as organization, leadership, public opinion, etc.

### **7-220. Introduction to Cultural Anthropology**

Spring, 3 credits (alternate years)

FORREST E. CLEMENTS

The origins of human culture, its historical development, language and culture, culture processes and principles of culture change. Stresses psychological factors in the acquisition and perpetuation of culture and analyzes human behavior as a resultant of innate and culturally acquired traits.

### **7-240. Mental Hygiene**

Fall, 3 credits

JOSEPH SAMLER

The formation of personality, its growth and dynamics. The relationship between mental health and self-respect. Emphasis is placed on motivational factors, conscious and unconscious, and upon personality as a function of inter-personal relationship. A term project will provide practice in observation of behavior and in attempting to understand underlying motivations.

**7-301. World Population Problems**

Fall, 3 credits

DUDLEY KIRK

A general introduction, with emphasis on population problems and prospects in the United States. Training in use of United States and foreign census and vital statistics for the analysis of measurable human resources and social trends. Review of Malthusian and subsequent theories of population. Factors determining historic growth and distribution of the world's population. The current upsurge in population numbers. International and regional differences in the present balance of births and deaths. Economic, social, and resource factors in vital trends and prospects for growth. The impact of foreign aid programs on population trends in underdeveloped areas. Interpretation of population trends and prospects in the United States. Evaluation of population forecasts.

**7-303. Child and Adolescent Psychology**

Spring, 2 credits

KATHARINE P. BEARDSLEY

Study of the development of human behavior from the prenatal period through adolescence in terms of the processes of physical, mental, emotional and social growth in the individual. Particular emphasis will be given to the interactions of the child's total personality.

**7-304. The Conditions of Personality Growth**

Fall, 2 credits

KATHARINE P. BEARDSLEY

This course treats the principal factors influencing personality development: physiological bases, early experiences and cultural determinants. It considers both experimental and clinical contributions to the study of personality, and their application to practical problems of understanding and dealing with people.

**7-325. Managing Personal Finances**

Fall, 3 credits. Repeated in the Spring

C. M. MOUSER

The course has three main purposes: (1) to assist persons in planning the management of their finances to meet future needs; (2) to discuss principles which govern day by day financial decisions; (3) to acquaint students with the major financial instruments. Topics included are: building up of savings for such purposes as the education of children; plans for home ownership; fund for old age and retirement; renting versus owning a home; costs of home ownership; financing durable and other consumer goods; sources and costs of consumer credit and installment buying; life insurance and annuity contracts; protection versus savings; property liability and other insurance programs; planning and administration of estates; joint ownership; laws of intestacy; making a will; administration of estates as executor or administrator; proof of will, costs and fees; deeds, abstracts, mortgages, trusts, contracts, notes, stocks, bonds, debentures, and savings account; an introduction to the mathematical calculations needed in order to understand and use these instruments.

**7-332. Introduction to Contemporary National Cultures**

Fall, 3 credits

CLAIRE HOLT

Cultural backgrounds and behavior characteristics of different racial and national groups. Differences between these and American cultural and behavior patterns; phases in greatest conflict and likely to lead to misunderstanding. Use of cultural analysis in developing and administering international programs to the end that cultural conflicts can be recognized and identified. The course is adapted particularly to those concerned with developing and administering programs in foreign countries.

**7-400. Introduction to General Semantics**

Fall, 2 credits. Repeated in Spring

J. A. SAUNDERS

General Semantics may be defined as a study of human responses to language and other symbols; the relationships between words and things and be-

tween language and human behavior. It may be considered as a synthesis of science and the formulation of the general methods of science in such a way that they may be applied by the average individual to help him solve his every problem. The great majority of people who learn to apply the principles and methods of semantics find that these facilitate communication between individuals and between groups; eliminate the common errors in thinking which practically everyone makes at times and enables them to find more appropriate solutions to many of their problems (personal, professional, economic and social) in a shorter period of time and with a less expenditure of energy.

### 7-433. Social Psychology

Spring, 3 credits

CARL C. TAYLOR

A general course on the social aspects of personality, social interaction and collective behavior. It includes treatments of cultural conditioning of personality, personality measurement, communication, public opinion, propaganda, censorship, mobs, riots, and social movements. An individual project is required for the third credit. *Prerequisite:* A course in general psychology or equivalent.

### [7-442.] Personality Disorders (1954-55 and alternate years)

Spring, 2 credits

ALBERT C. CORNSWEET

### 7-458. Manpower and Labor Force Analysis

Spring, 3 credits (alternate years)

HAROLD WOOL

Study of the size, composition, and changing characteristics of the labor force and manpower. Working force theory and concepts of labor force and manpower. Problems of measurement of employment and unemployment levels and the interpretation of such statistics. Occupational, industrial, and class of worker composition and changes. Problems of geographic and occupational mobility in the light of factors facilitating or impeding mobility. The demographic socio-economic, and technological factors bringing about labor force and manpower changes. *Prerequisite:* Background in population or labor statistics is desirable.

### 7-465. The American Tradition

Spring, 3 credits

JOHN M. BREWSTER

The development of Western Society has imparted to our American heritage at least three distinct types of life and corresponding forms of society. These types may be designated as the (1) aristocratic (dictatorial) view, (2) the middle-class view which, in America, finally developed into (3) the ideal of the self-made man. This course analyzes leading ideas in each of these views, giving particular attention to the conditions under which they arose, in a manner useful to those seeking better understanding of current problems, both domestic and foreign.

### 7-470. Applications in General Semantics

Year, 1 credit each semester \*

J. A. SAUNDERS

Designed for advanced students of General Semantics who desire more experience in applying the principles, techniques and devices of this new discipline to the solution of personal, professional, community and national problems. Members of the group will work on problems of their own choosing. Persons who select similar problems will be organized into sub-groups. Each individual or group, by the second meeting, will be expected to have presented an outline of its project to the director for his approval. Each individual or group will be expected to prepare at least one paper or "report" for discussion and evaluation by the class. Credit will be awarded on the basis of written reports on student projects suitable for general distribution. Audit students will participate in all



activities of the group but need not submit reports for general distribution. *Prerequisite:* Completion of a course in General Semantics or equivalent, or permission of the instructor.

\* Students may attend both or either semesters.

## **7-482. Social Psychology of Communication**

Fall, 2 credits

RICHARD S. FITZPATRICK

Interpretation of communication research studies in light of social psychological theory. Analysis of social psychological theory for insight into communication habits and impact. Study of the social psychology of perception, value, leisure time, and cultural differences as they affect communications by mass media. Learning theory and educational level as they affect communication behavior. Communication behavior in selected cultures. Social psychological bases for opinion formation and implications of opinion shifts and changes. Analysis of communication systems and data for research purposes. Constructing a theory of the social psychology of mass media. *Prerequisite:* Permission of instructor.

## **7-515. Group Processes in Agricultural and Rural Life Programs**

Fall, 3 credits

CARL C. TAYLOR

A study of various types of groups and group techniques which agricultural agencies utilize in carrying out their programs, neighbor groups, special interest groups, farmer committees, communities, townships, counties, various types of districts, and trade-centered rural areas. Analysis of the most effective group techniques for various types of groups, neighborhood, community, county and other meetings, discussion groups, workshops, conferences, audiences, etc. Analyses of leader-follower patterns, the roles of "functionary leaders" (agents), the role of "natural leaders" and "natural groups." To the extent that students are actual participants in agricultural programs the course will be conducted on a laboratory basis.

## **7-516. The Cultural Regions of the United States**

Spring, 3 credits (alternate years)

CARL C. TAYLOR

A study of the cultural regions of the United States, covering in detail the characteristics of the various regions and subregions and their interrelationships, including settlement patterns, social organizations and institutions, prevailing ideologies, mores and folkways, and dominant attitudes and opinions of the people who live in the rural areas of these cultural regions. *Prerequisite:* Two courses in the social sciences.

## **7-519. The American Farmers' Movement**

Fall, 3 credits

CARL C. TAYLOR

The American Farmers' Movement. A study of American farmer upheavals and farmers' organizations from the Virginia-Maryland Tobacco Rebellion in the 1600's, to the present, including Shays' Rebellion, Jeffersonian Agrarianism, the Whisky Rebellion, early agricultural societies, the origin of the Grange, Farmers' Alliance, Greenback and Populist Parties, the American Society of Equity, the Non-Partisan League and the Farmers' Holiday Association. A detailed study of the present general farmers' organizations, the Grange, Farmers Union, Farm Bureau and others, how and why they were organized and how they func-



tion on local, state and national levels; the roles they play as economic and political pressure groups and in agricultural policy making. Comparison with farmers' organizations in other countries than the United States.

### 7-540. Health and Medical Service Problems, Policies and Programs

Fall, 2 credits

MARGARET C. KLEM

HELEN L. JOHNSTON

Discussions concerned with the general measures of the health status of the population. Existing and needed health personnel and facilities, health programs of voluntary and official agencies, and current legislative proposals relating to health. To extent possible, discussions will be adapted to special interests of the group. *Prerequisite:* Consent of leaders.

## HISTORY AND INTERNATIONAL RELATIONS

### COMMITTEE

H. DUNCAN HALL (Chairman)

O. B. CONAWAY

STANLEY K. HORNBECK

NELSON T. JOHNSON

WALTER KOTSCHNIG

HAROLD LASSWELL

FRED J. ROSSITER

CLAYTON E. WHIPPLE

FRANCIS O. WILCOX

The perspective of history throws light on the question: "How have we come to where we are?" It cannot answer the question: "Where are we going from here?" But it is a guide to the possible routes.

Today it is essential that the citizen keep abreast of the wide range of the relations that exist between his country and other countries, between his people and other peoples, and the new conditions that govern those relations. Two world wars, having immediate causes in areas and among peoples remote from the ordinary occupations and tensions of American life, definitely and perhaps irretrievably have involved the United States in world affairs and relationships far beyond any experience in its past.

On the political side, world power has shown the tendency to become more or less polarized between two Great Powers, the United States and the Union of Soviet Socialist Republics. Profound changes, of which the results cannot be foreseen, are taking place in the political alignments of many nations. New regional consolidations are taking place. Cultural interests, economic relations, and political security are all being changed and reshaped. New technical advances are part of the driving forces making for change. New techniques in the handling of foreign relations are being developed. Old methods of bilateral negotiation for the settling of international problems are supplemented by the new multi-lateral machinery of the United Nations.

Security, spiritual, material, and political, was at the very foundation and purpose of government and human social organizations from the time nations took form up to our own times. But the conditions of security are changing. The notion of security as something bounded by physical frontiers is perhaps changing most of all. Ideas spread from mind to mind throughout the free world; and, at least on a one way basis, between the free and the closed world. The instruments of mass communication, like the radio, impose on governments new problems of public relations in the international sphere.

Lectures and courses in history and international relations are designed to give the student some opportunity for (1) acquainting himself with the new techniques and approaches to international relations; (2) acquiring insight into basic materials, causal factors and historical backgrounds that determine the main current trends in international relations; and (3) getting a deeper knowledge of some of the main world problems and their impact on particular regions and countries.

Special emphasis is laid in these courses on student participation. The varied backgrounds and experience of both lecturers and students, and the nature of the courses, should ensure that students will learn not merely facts, but the ability to think about them.

### **7-250. American History to 1865**

Fall, 3 credits

WAYNE D. RASMUSSEN

A survey of the political, social, economic, and cultural forces, prior to 1865, which have contributed to the development of American civilization. Includes a summary of the colonial period; the political, economic, and diplomatic factors of the American Revolution; and the development of national life and institutions.

### **7-251. American History since 1865**

Spring, 3 credits

WAYNE D. RASMUSSEN

A survey of the political, social, economic, and cultural forces which, since 1865, have contributed to the development of present-day American civilization. Includes the frontier movement and immigration; constitutional growth and changes in world relations; and economic change and development.

### **7-324. International Relations**

Spring, 3 credits

H. DUNCAN HALL

An introductory course dealing with the nature and problems of the state in the modern world community; foundations of its power, influences upon its policy, and the character of its procedures. Diplomacy, nationalism, imperialism, international organization and other problems will be discussed.

**7-465. The American Tradition** (See p. 88)**7-519. The American Farmers' Movement** (See p. 89)**7-655. The British Commonwealth and the United States**

Fall, 3 credits

H. DUNCAN HALL

A survey and analysis of the historical development, present nature and structure of the Commonwealth. The growth of the independent nation states within the Commonwealth. The older Commonwealth, and its new members (India, Pakistan and Ceylon); the growth of the Commonwealth in Asia, Africa and the Caribbean. The special quality of Commonwealth nationalism. Common and divergent interests, and the institutions and machinery of the Commonwealth for handling them and the relations of its members with other states. The bonds of past history, similar constitutional structure, family ties, common Crown, common citizenship. The bonds of corporate fellowship which link—through common symbols, allegiance, channels of communications, institutions and interests—the governing elements within each Member of the Commonwealth: Ministers of the Crown, members of the 50 Parliaments, judges, civil servants, members of the armed forces. The roles of the Commonwealth in world affairs: (1) relations with the United States and the place of the Commonwealth in its foreign policies and interests, (2) relations with the European and Atlantic systems, (3) the Commonwealth as a bridge with Asia, (4) its role in the United Nations. *Prerequisite:* Advanced undergraduate or graduate training in history or other social science or consent of instructor.

**7-660. American Foreign Relations, Policies and Practices**

Spring, 3 credits

NELSON TRUSLER JOHNSON

Fundamental principles as developed in the conduct of our foreign relations from the Declaration of Independence up to the close of the free immigration period in 1925; significant subsequent developments through and following World War II, requiring us to accept and meet the responsibilities which go with our position among the nations.

United States Government organization for conducting its business with other governments. Factors which have played major roles in the development of foreign policy: commerce, international finance, shipping, fishing, agriculture, etc.; public opinion and the influence of media of mass communication; minority and pressure groups; etc. Implementation of foreign policy in peace and war, choice of people and machinery; informing other peoples about ourselves and how best to accomplish it. Need for effective coordination of our governmental machinery so as to identify and harmonize the needs and convictions of the whole American people in a united common action for the achievement of their ideals. Present methods of coordination. Other possible methods, including the Secretariat system. *Prerequisite:* Advanced study in the social sciences, or responsible administrative or supervisory experience, or approval of instructor.

**7-670. Contemporary Problems in International Affairs, Their Background and Historical Parallels**

Fall, 3 credits

H. M. SPITZER

The position of the United States in the world of today: the United States as an active material and spiritual force; the United States as an element in the policy of other nations. General factors which change the international

scene: ideology, technology, population pressure, mass communication and mass participation. Colonial emancipation. Efforts to stabilize the political scene: ideology, technology, population pressure, mass communication and ment program—regional problems, cross currents in Europe, the Islamic world, Asiatic riddles. These situations will be discussed both topically (as they present themselves today) and genetically (how they came to assume their present form). Where similar situations have arisen in the past, parallels between present and past will be drawn to show the way in which and the success with which such situations have been dealt with. *Prerequisite:* Advanced undergraduate work or degree or approval of the instructor.



# Technology

## DEPARTMENTAL COMMITTEE

F. J. SETTE (Chairman)

R. G. HAINSWORTH  
H. E. HILTS  
HARRY F. MABBITT

J. P. SCHAEZNER  
E. J. STOCKING  
E. J. UTZ

MARSHALL S. WRIGHT

—O—

Various departments and agencies of the Federal Government are engaged in programs such as flood control, soil conservation, power development, mapping, and rural electrification, which involve in varying degrees engineering techniques and professional engineers. They include many functions which require a working knowledge of techniques not provided in the standard engineering courses.

Basically, education in engineering schools is limited by necessity and tradition to a period of four or five years. This short period of training provides sufficient time to assimilate and master only a minimum of the basic sciences. There is little time available for courses which will give the technical student an understanding of the social and economic problems of the world about him. As a result, he fails often to appreciate the impact upon society of the advances of his profession. Moreover, technological techniques and practices are never static and developments in the sciences and in engineering require enlarging and constant reorienting of the engineer's technical background.

The Graduate School, working with representatives of the various Government departments and agencies and of the local chapters of engineering societies, offers courses designed to add to the technical, professional, and administrative background of engineers in the service of the Federal Government. Many courses offered provide training in the latest techniques that colleges and technical institutes often cannot provide.

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## ENGINEERING

### COMMITTEE

J. P. SCHAEZNER (Chairman)

J. A. C. CALLAN  
J. H. GEHRING  
FERDINAND KAUFHOLZ  
W. D. POTTER

HARRY SAWCHUCK  
F. F. SNYDER  
E. J. UTZ  
JOHN A. WEBER

## 8-110. Principles of Electricity

Spring, 2 credits

DAVID ASKEGAARD

Principles of electricity, emphasizing alternating currents. Covers basic units such as voltage, current and power and their measurement, resistance,

voltage regulation, line loss, power factor, three phase systems, etc. The function of equipment used on rural electric distribution systems such as generators, substations, transformers, lightning arrestors, fuses, oil circuit reclosers, etc., will be emphasized.

### 8-115. Practical Electronics

Year, 2 credits each semester

H. WALTER PRICE

General principles of electronics; basic characteristics of resistance, capacitance, and inductance taken singly and in combination; practical basic electronic components; elementary circuit analysis particularly as it pertains to series and parallel resonance; circuits with distributed constants; generation and propagation of radio waves; fundamental principles of electron tubes including diodes, triodes, and pentodes; voltage amplifications. The course stresses how electronic circuits work and is substantially non-mathematical using only algebraic concepts and elementary complex notation.

The second semester is a continuation and elaboration of subjects undertaken in the first semester; class A, B and C power amplification; rectifiers and power supplies; sine-wave oscillators; amplitude modulation and detection; frequency modulation; transmitters; receivers including the superheterodyne; basic pulse circuits; fundamentals of television; theory and use of test equipment. *Prerequisite:* Physics, Algebra, Trigonometry, DC Electricity, AC Electricity, or consent of instructor.

### [8-402.] Principles and Practice of Refrigeration (1954-55 and alternate years)

Fall, 2 credits

HARRY L. GARVER

### 8-405. Principles of Specifications

Fall, 2 credits

BENJAMIN ROSENZWEIG

A basic course in the principles underlying the government specifications systems. A brief survey will be made of procurement documents and the purposes they serve. The organization of specifications for form, clarity, and effectiveness will be demonstrated. The evolution and ramifications of specifications will be considered with regard to research and development; legal and contractual relations; proprietary items; and government inspection. The division of specifications into performance and formulation types will be reviewed. The problems of standardization and industry coordination will be discussed. *Prerequisite:* Knowledge of procurement, inspection, research and development processes, or specification writing.

### 8-560. Fundamentals of Telephony I

Fall, 2 credits (alternate years)

ROBERT S. NEIKIRK

Description of outside plant construction and practices followed. Detailed description of the telephone set, methods of signaling and supervision. System layout and central office planning. Exchange loading and transmission.

### 8-561. Fundamentals of Telephony II

Spring, 2 credits (alternate years)

ROBERT S. NEIKIRK

Principles of manual and dial central office operation, repeater, carrier, composite and radio equipment. Toll transmission.

### [8-702.] Electric Utility Engineering (1954-55 and alternate years)

Year, 2 credits each semester

J. J. A. JESSEL and ALMON D. THOMAS

### 3-412. Statistics for Engineers

(See p. 35)

## SURVEYING AND MAPPING

## COMMITTEE

MARSHALL S. WRIGHT (Chairman)

WALTER DIX  
GEORGE H. EVERETT  
W. S. HIGGINSON  
J. E. KING  
GUNNAR LEIFSON  
ALBERT L. NOWICKI

ROBERT H. RANDALL, JR.  
HOWARD S. RAPPLEYE  
LANSING G. SIMMONS  
G. C. TEWINKEL  
H. W. WHITLOCK  
ARCHER M. WILSON

Maps have played an important part in human progress. To-day, as never before, they furnish the basis for both military and non-military activities throughout the world. Greater use of maps has brought increasing demand for persons qualified in each of the technical phases of map production and reproduction.

The purpose of the curriculum in surveying and mapping is to offer basic training for those persons who are engaged in the technical and supervisory aspects of map making. The curriculum is intended to give the student a broad knowledge and basic understanding of each of the separate phases of the science; to enable him to understand better the problems, possibilities, and limitations of each of the phases. He can then better plan his own activities toward the economical production of accurate maps. A large part of the curriculum is devoted to geodesy, a subject considered to be of increasing importance in view of modern rapid means of world-wide travel, the consequent need for world-wide charts, and the development of new methods in surveying.

At least two years' work toward a degree of Bachelor of Science in Civil Engineering is considered as being the logical background for the curriculum in surveying and mapping. Many other potential students will also find that they may have already fulfilled all or nearly all the prerequisite studies. It should be emphasized that Calculus and College Physics are desirable prerequisites for advanced courses. Persons who are planning a career in this field are urged to arrange their schedules so as to include these courses at the earliest opportunity.

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*Surveying***8-135. Elementary Surveying**

Fall, 3 credits (every third year)

ERNEST J. PARKIN

Use of the transit, level, compass and accessory equipment; adjustment of instruments; field methods of transit-and-tape traverse and engineers' leveling (differential and profile); computations connected with above including adjust-

ment of traverses by compass and transit rules, computation of latitudes, departures, and areas. Lectures, classroom work, and field work. *Prerequisite:* Plane trigonometry.

### 8-204. Ground Methods of Topographic Surveying

Spring, 3 credits (every third year)

ERNEST J. PARKIN

Transit and stadia; plane table and stadia; approximate methods, special methods for peculiar conditions; Beaman stadia arc; Baldwin solar chart, etc. Lectures, classroom work and field work. *Prerequisite:* Elementary surveying and plane trigonometry.

### [8-215.] Route Surveying (1954-55 and every third year)

Fall, 3 credits

ERNEST J. PARKIN

### [8-217.] Astronomy for Engineers (1954-55 and every third year)

Spring, 3 credits

ERNEST J. PARKIN

### [8-218.] Geodetic Surveying (1955-56 and every third year)

Fall, 3 credits

ERNEST J. PARKIN

### [8-219.] Computation and Adjustment of Geodetic Observations (1955-56 and every third year)

Spring, 3 credits

ERNEST J. PARKIN

### 8-440. Theory of Geodesy

Year, 3 credits each semester (alternate years)

ALFRED D. SOLLINS

Introduction to geodesy from the geometric viewpoint (triangulation, geodetic astronomy) and from the physical viewpoint (potential theory, gravity). Determination of the figure of the earth, role of deflections of the vertical, and of gravity measurements; undulations of the geoid and the Stokes' functions; datum determination. The basic theories of isostasy. Mathematics is developed as needed. The aim of the course is to develop the student to the point where he will be able to appreciate the interrelations of the separate fields within geodesy and the manner in which they supplement one another in extending our knowledge of the earth. *Prerequisite:* Calculus, course 8-219, or experience as determined by the instructor.

### *Photogrammetry*

### 8-120. Introduction to Photogrammetry

Fall, 2 credits

RAY A. KELSEY

Lectures and demonstrations in non-technical terms cover: the history and development of photogrammetric engineering; the importance of optics; basic principles of photography; types of aerial photography, aerial cameras, accessory equipment, and photographic aircraft; requirements of coverage, flight lines, tilt, and scale; photo interpretation and stereoscopes; requirements of horizontal and vertical control; radial plot and stereoscopic plotting instruments. Designed for persons who use aerial photographs in military planning and operations, highway development, agricultural land use and conservation, mineral and petroleum exploration, and in other engineering and industrial operations.



### 8-208. Aerial Photographic Interpretation

Fall, 3 credits

ETHAN D. CHURCHILL

Principles, techniques and applications of aerial photographic interpretation; history, concepts, types of aerial photographs, principles, techniques, and applications. Study, and use in various fields, of aerial photographs as a source of detailed natural and cultural information. *Prerequisite:* A general background in one of the following fields: surveying and mapping, cartography, geography, geology, forestry, agriculture, architecture, or allied engineering fields.

### 8-212. Photogrammetry I

Fall, 2 credits

W. S. HIGGINSON and G. C. TEWINKEL

Basic optics; basic geometric characteristics of aerial photographs; aerial cameras; camera mounts; basic photography and laboratory practices; photographic materials. *Prerequisite:* College plane trigonometry.

### 8-213. Photogrammetry II

Spring, 2 credits

W. S. HIGGINSON and G. C. TEWINKEL

Flight planning; aerial photographic specifications; radial line plotting methods; mosaics; determination of elevations from photographs; photo-interpretation. *Prerequisite:* College plane trigonometry.

### 8-370. Photogrammetry III

Fall, 2 credits (alternate years)

G. C. TEWINKEL and W. S. HIGGINSON

Geometry of the tilted photograph, the oblique, and the horizontal; introduction to tilt determination and analytic computations; study of multiplex equipment including projectors, support bars, electric circuits, tracing table; theory of multiplex, including interior and exterior orientation; multiplex practice. *Prerequisite:* Photogrammetry I and II.

### 8-371. Photogrammetry IV

Spring, 2 credits (alternate years)

G. C. TEWINKEL and W. S. HIGGINSON

Stereoscopic plotting instruments; rectification; the use of horizontal and oblique photographs; the photo alidade; continuation of multiplex theory and operational practice, including map control (horizontal, vertical and extension), planimetry and contours. *Prerequisite:* Photogrammetry III.

### 8-408. Advanced Aerial Photographic Interpretation

Spring, 3 credits (alternate years)

ETHAN D. CHURCHILL and SPECIALISTS

A seminar on the application of aerial photographic interpretation to specialized technical fields, such as forest, range, and wildlife management; agricultural soil, engineering soil and vegetation surveys; geology and petroleum geology; population census in rural and urban areas. *Prerequisite:* Basic training in aerial photographic interpretation or consent of instructor.

## Cartography

### 8-125. Introduction to Cartography

Spring, 2 credits

EDWIN H. SERVESON

The purpose of this course is to introduce the student to the broad field of cartography. This includes general instruction in the history of maps; the shape of the earth; the fundamental concepts of the most common projections; the basic principles of surveying, topography, hydrography, photogrammetry, oceanography and sketch mapping; the classification, evaluation, compilation, con-

struction and revision of maps and charts; and the methods and techniques of reproduction. See also course 5-114, Maps and Charts, in the Department of Physical Sciences.

### 8-222. Cartography I—Technical Elements

Fall, 2 credits

GEORGE H. EVERETT

Course introduces the student to the use of geodetic principles in solving problems of geographic position and the application of these principles in map compilation problems. It includes a study of Clarkes Spheroid, coordinate systems for expressing relative location, plotting and the scale problem of maps, control and orientation problems, map datums, graphic methods of determining location and orientation, use of the position formula, curvature of the parallels, principles of locating plane coordinate positions on a geographic projection. *Prerequisite:* College plane trigonometry.

### 8-223. Cartography II—Map Projections and Grid Systems

Spring, 2 credits

EDWARD W. FONFARA

Includes: basic principles with practical applications; computations; use of tables; layout; definitions; classifications; and characteristics. Identification of such standard projections as the polyconic, mercator, transverse mercator, Lambert conformal, gnomonic, and stereographic; and coordinate systems including rectangular, broad-area and true military grid.

This subject is presented from the practical viewpoint without the complex variable theory applications. *Prerequisite:* College plane trigonometry.

### 8-224. Cartography III—Large Scale Maps

Fall, 2 credits (alternate years)

CYRUS FINLEY and JACOB SKOP

Includes a review of the fundamental principles of cartography and the application of these principles with emphasis on large scale maps. Specific topics include: types and scales of maps; classification of the earth's features and their interpretation in symbolization; names; drainage, relief, woodland and vegetation, and other cultural features; foreshore and offshore hydrography; public land surveys; methods and procedures for making large scale maps; pre-compilation preparation; aerial photography; horizontal and vertical control; classification surveys; the compiler and his work; compilation; editing and field checking; color separation drafting; photolithographic reproduction; and military grids. *Prerequisite:* Cartography I and II or equivalent.

### 8-225. Cartography IV—Small Scale Maps

Spring, 2 credits (alternate years)

MARCUS A. ROSENBAUM

Factors to be considered in selecting the projection for the map, the scale, and the material for the compilation; drawing the map and preparing it for reproduction; compilation, reproduction, and use of the Army Map Service series of maps; the Nautical Chart Series including their compilation, reproduction and application to navigation; the Aeronautical Chart Series including their compilation, reproduction, and application to air navigation. *Prerequisite:* Cartography I and II or equivalent.

### 8-240. Methods of Map Reproduction

Spring, 2 credits

M. S. A. DELANEY and SPECIALISTS

Designed for persons engaged in the various phases of surveying and mapping. Covers modern media used in the preparation of the original and the original map copy itself for reproduction; the requirements of a good map/chart original; the advantages and disadvantages of photolithography, letter press, and gravure, including ozalid and photo-gelatin; color separation originals, negatives,

and printing plates; combining half tones with the contour system. Provides the student with a broad working knowledge of the many steps involved in duplicating the map/chart original in black and white and multicolor work. Economy and precision in map-making is predicated on a knowledge of the process selected for reproduction.

**[8-430.] Theory of Map Projections (1954-55 and alternate years)**

Fall, 3 credits

ALFRED D. SOLLINS

**FINE ARTS AND ARCHITECTURE**

**COMMITTEE**

HARRY F. MABBITT (Chairman)

O. A. DE LA ROSA

ROWLAND LYON

HENRY A. MAGNUSON

BEVERLY ROBINSON

N. P. STATHIS

LEO G. WIEMER

*Fine Arts*

**8-320. Water Color Painting**

Fall, 2 credits. Repeated in Spring

ROWLAND LYON

Theory and practice; painting from landscape and still life.

**8-321. Pencil Sketching—Life Drawing**

Fall, 2 credits. Repeated in Spring

DUANE A. McKENNA

A progressive course of study and practice designed to give the student a thorough working knowledge of the human figure. Emphasis on personal observation and experience so the student may express a full understanding of the essential properties of motion, structure, and form. Drawing from the model and outdoor sketching included. Open to both beginners and advanced students.

**8-60. Pencil Sketching and Water Color Painting**

Summer, non-credit

ROWLAND LYON

An informal class in theory and practice. Student may use either or both media. Class meets out-of-doors whenever possible.

**8-323. Portrait Painting in Oil**

Fall, 2 credits. Repeated in Spring

PIETRO LAZZARI

To enjoy this course the student need not have experience as an artist but must have the desire to achieve proficiency in portraiture.

Professional methods of painting oil portraits incorporating the basic techniques of the old masters and the spirit of modern art. Course includes, sketching, line composition and light arrangement; color, theory and technique of painting in oil. All work done from life.

**8-331. Sculpture**

Fall, 2 credits. Repeated in Spring

LILLI GETTINGER

A course of individual instruction for beginners and experienced students. Modeling with clay, wood, and plastics. The class meets in instructor's studio.

**8-333. Survey of Art**

Fall, 2 credits

CHARLES M. RICHARDS

The course is designed to establish the basic values which underlie artistic achievement and to develop an appreciation of these values before the objects themselves. From age to age these basic values—the aesthetic values—remain the

same. The lectures will attempt to relate the major epochs to one another so as to indicate the continuity of art history and at the same time contrast the variant forces and ideas which produced such differing styles and expressions.

### 8-334. Modern Painting

Spring, 2 credits

CHARLES M. RICHARDS

This course begins with a study of the art of the outstanding masters of the 17th Century and of the general current of painting in that century, with emphasis on the development of painting through the National Schools and styles up to the present moment. The main concern will be to arrive at an understanding and appreciation of impressionism and post-impressionism.

### *Architecture and Drafting*

### 8-305. Elements of Statistical Drafting

Fall, 2 credits. Repeated in Spring

NELSON P. GUIDRY

A practical course in drafting involving actual preparation of statistical maps and charts in class. Explanations of short cut methods of lettering technique and arrangement of component parts of illustrations. Complete illustrations will be prepared in ink ready for publication. The reduction, reproduction, and color application to statistical maps and charts will be explained. Students supply their own drafting tools.

### 8-316. Landscape Design—Small Property

Fall, 2 credits

Instructor to be announced

The purpose of this course is to encourage and direct the creative impulse of the person interested in the landscape development of the small property, thus creating more interest and pleasure in the home. The course will include an outline of the basic principles of land planning and their application to the design of the small property, with discussion of the principles of composition in relation to the selection and use of plants and other materials. The practical application of landscape design principles to specific problems. A discussion of the physical aspects of landscape development including construction methods, horticultural standards and maintenance requirements. Each member of the class will be required to submit a statement concerning his program for the plan and development of his property or property of his selection.

### 8-324. Basic Mechanical Drawing I

Fall, 2 credits

HARRY ZIEG

The use of drawing instruments. Lettering and dimensioning. Problems in conventional presentation of objects by means of lines, including geometrical problems, orthographic projection and auxiliary projection. One hour lecture and three hours drafting room work each week.

### 8-325. Basic Mechanical Drawing II

Spring, 2 credits

HARRY ZIEG

Advanced instruction in the elements taught in Basic Mechanical Drawing I. Developments and intersections. One hour lecture and three hours drafting room work each week. *Prerequisite:* Basic Mechanical Drawing I or equivalent.

### 8-340. Architectural Drafting I

Fall, 2 credits

HARRY ZIEG

Frame house construction. Study of wood framing and related building materials; arrangement of rooms and furniture; the economy of good construction. Drawing of plans and elevations of a frame residence from sketches. One hour lecture and discussion and three hours drafting room work each week. *Prerequisite:* Basic Mechanical Drawing II or equivalent.



**8-341. Architectural Drafting II**

Spring, 2 credits

HARRY ZIEG

Large scale drawing of exterior and interior details for the frame residence studied in Architectural Drafting I. One hour lecture and discussion and three hours drafting room work each week. *Prerequisite:* Architectural Drafting I or equivalent.

**8-342. Architectural Drafting III**

Fall, 2 credits

HARRY ZIEG

Study of masonry construction and related building materials. Site plan study and drawing. Preparation of plans and elevations of a masonry building from sketches. One hour lecture and discussion and three hours drafting room work each week. *Prerequisite:* Architectural Drafting II or equivalent.

**8-343. Architectural Drafting IV**

Spring, 2 credits

HARRY ZIEG

Large scale drawing of exterior and interior details for the masonry building studied in Architectural Drafting III. Outline study of the Orders of Architecture. One hour lecture and discussion and three hours drafting room work each week. *Prerequisite:* Architectural Drafting III or equivalent.

**TECHNICAL ARTS****COMMITTEE****R. G. HAINSWORTH (Chairman)**SADYE F. ADELSON  
EDWARD S. COBBDOROTHY NICKERSON  
ELBRIDGE C. PURDY

MARY A. ROKAHR

**8-55. Introduction to Interior Decoration**

Fall, non-credit. Repeated in Spring

MARTHA L. HENSLEY

A non-credit course designed for persons who wish a non-professional knowledge of the principles of color and design to help them with their home-decorating problems. Topics discussed include discovering and using design, elements and principles of design, color and color systems.

**8-65. Modern Homemaking for Employed Men and Women**

Spring, non-credit

LYDIA A. LYNDE and AVIS M. WOOLRICH

Up-to-the-minute practical information on home management and family relationships is given by specialists in a series of popular lectures, each followed by a question-and-answer period. The course is designed primarily for married and engaged couples, but is open to others. Registration for one head of the family will include the other. Attendance of both is encouraged.

The course will be developed around the interests of members to cover such topics as: family financial planning; menu planning; buying food; selecting the home; functional house planning; selecting and arranging home furnishings; selecting and storing household equipment; managing the work in the home; selecting clothing to suit pocketbook, wearer, and function; care of clothing; family cooperation; and child guidance.

**8-188. Glass Blowing**

Year, 2 credits each semester

L. B. CLARK, SR.

L. B. CLARK, JR.

A laboratory course for technicians. Simple manipulation of joining, bending, and shaping is carried through to the production of useful apparatus.

Metal in glass and glass to metal seals of all types are made. During the first semester the soft glasses are utilized for practice; during the second semester the related glasses are used. Ample opportunity for advanced work is given those who show themselves particularly adapted to the work. (New students may be admitted in the Spring if space permits.)

### 8-230. Household Furnishings I—Furniture

Fall, 2 credits

MARTHA L. HENSLEY

A survey of furniture from the early Egyptian period to the present day. The survey includes the effect of government, conditions, and architecture on the furniture of each period. The present day adaptations and uses of the furniture of each period are studied.

### 8-231. Household Furnishings II—Textiles

Spring, 2 credits

MARTHA L. HENSLEY

A survey of household textiles from the early Oriental periods to the present day. The survey includes the decorative designs, weaves, and fibers of each period. The present day adaptations and uses of the fabrics of each period are studied.

### [8-415.] Food Cost Control (1954-55 and alternate years)

Fall, 2 credits

LOUISE A. K. FROLICH

## PHOTOGRAPHY

### COMMITTEE

R. G. HAINSWORTH (Chairman)

EDWARD S. COBB  
RAYMOND DAVIS  
WILLIAM J. FORSYTHE  
R. J. LEFEBVRE

KEITH B. LEWIS  
ALBERT R. MATERAZZI  
HOWLAND PIKE  
ELBRIDGE C. PURDY

ROY M. REEVE

### 8-70. Survey of Photography

Fall, non-credit. Repeated in Spring and Summer

WILLIAM C. MCHENRY

This is a lecture, demonstration course of a non-technical nature. It is intended particularly for those camera enthusiasts who desire a clearer understanding of how their cameras, films and prints work. Better pictures should be the result of taking this course. Topics covered: camera types and operation; film types and uses; developing and printing; filters; exposure; planning, composition and lighting; portraiture; motion pictures; color photography. Exhibition and demonstration of equipment, materials and techniques supplement class lectures and discussion.

### 8-80. Survey of Motion Picture Photography

Fall, non-credit

LANCE G. HOOKS

A non-technical lecture-demonstration course designed especially for amateur movie makers. Covers the fundamental techniques of making color and black and white personal motion pictures. Topics include: camera sizes, types and operation; film types and uses; lenses; filters; planning; continuity; composition; lighting; exposure; editing; titling and projection. Exhibition and demonstration of equipment, materials, techniques supplement class lectures and discussion.

### 8-161. Theory of Lithography I

Fall, 2 credits

WILLIAM C. MCHENRY

This intensive course provides fundamental knowledge and information upon which advanced work in this field may be built. It provides a thorough grounding in the materials, equipment and procedures of a complete lithographic operation. Topics covered: camera and darkroom equipment and techniques; optical problems; photomechanical sensitive materials and their behavior; lithographic darkroom chemistry; line negative making; dot formation; half-tone screens and filters; coordination of filter characteristics with color sensitivity of films; optical and film screens; layout, imposition and stripping; coordination of copy preparation and cameraman; platemaking; paper and ink; press work; bindery equipment and operations; work flow in a lithographic plant, scheduling and coordination. *Prerequisite:* Fundamentals of Photography I, or equivalent school work, or consent of instructor.

### 8-162. Practice of Lithography I

Fall, 2 credits

RICHARD C. BALL

A course of demonstration and practice designed to supplement and explain the practical application of theories discussed in Theory of Lithography I. *Prerequisite:* Theory of Lithography I, or may be taken concurrently with Theory of Lithography I.

### 8-163. Theory of Lithography II

Spring, 2 credits

WILLIAM C. MCHENRY

Continuation of Lithography I, providing advanced and refined study in the field of lithography. Topics covered: wet plate work; color and tone correction, dot etching; advanced color separation; color stripping, magenta masking method; mathematical, chemical and physical measurements of lithographic materials and procedures; selection and care of mechanical equipment; management of a lithographic plant. *Prerequisite:* Theory of Lithography I.

### 8-164. Practice of Lithography II

Spring, 2 credits

R. J. LEFEBVRE

A course of demonstration and practice designed to supplement and explain the practical application of theories discussed in Theory of Lithography II. *Prerequisite:* Theory of Lithography II, or may be taken concurrently with Theory of Lithography II.

### 8-192. Fundamentals of Photography I

Fall, 2 credits. Repeated in Spring

EDWARD S. COBB

Forms a foundation for all of the more advanced courses in photography. Topics covered: nature of the photographic process; light as applied to photography; factors in development; developing solutions; exposure; lenses and image formation; photographic light and lighting; fixing and washing processes; and principles and use of filters.

### 8-193. Practice of Photography I

Fall, 2 credits. Repeated in Spring

JAMES A. BEALES

This course furnishes laboratory practice and demonstration of the principles taught in Fundamentals of Photography I. It offers the student an opportunity to become familiar with recommended procedures and techniques. Topics covered: contact printing and processing; selection of printing papers; processing of negative roll film, cut film and film pack; diagnosis and remedy of processing defects; types of cameras, their operation and uses, and the application of filters. *Prerequisite:* Fundamentals of Photography I, or taken concurrently with Fundamentals of Photography I.

**8-194. Salon Technique, Art and Composition**

Fall, 2 credits

RICHARD C. BALL

Analysis and demonstration of the various pictorial elements necessary to successful picture making. Training the student to recognize and use such factors as mass, line, form, space, tone, perspective, and design to serve the picture purpose. How to dramatize the subject. Developing creative imagination.

**8-195. Fundamentals of Photography II**

Spring, 2 credits

JOSEPH A. SCHANTZ

Subjects included: practical sensitometry and gradation control; the theory of projection printing; the nature of photographic light, its characteristics, control and measurement; shutter types and their performance; chemistry of photographic processes and the use of color film. *Prerequisite:* Fundamentals of Photography I.

**8-196. Practice of Photography II**

Spring, 2 credits

JAMES A. BEALES

Subjects included: application of sensitometric measurements, projection printing, print correction, composite printing, lighting, rendition of form and texture, light patterns, the effect of light on color, toning and print quality analysis. *Prerequisite:* Practice of Photography I.

**8-197. Pictorial Photography—Special Techniques**

Spring, 2 credits

RICHARD C. BALL

A workshop class with the students participating. Use of special printing papers and special processing for unique effects. Making and using texture screens. Formulas and procedure for toning prints in various colors. Solarization and bas-relief printing. Making and using paper negatives. The tone-separation process, its uses and simplified procedure. How to make photograms, carbro prints, and carbon transfers. Complete procedural phases of the Flexichrome process.

**8-270. Color Photography I—Camera Techniques**

Fall, 3 credits

ALDO A. CARANO

Covers the general camera techniques of color photography and the use of current materials and equipment. Instruction in lighting, exposure, color balance and processing of monopak materials such as Kodachrome and Ektachrome. Lectures and supervised studio and laboratory demonstrations. *Prerequisite:* Fundamentals of Photography II and Practice of Photography II or equivalent in training and experience.

**8-271. Color Photography II—Camera and Printing Techniques**

Spring, 3 credits

ALDO A. CARANO

The making of still and table top color pictures from the start to the finished picture, with demonstrations and practice in lighting and the use of a view camera.

The printing is designed to cover in detail the use of the color Printon method. Instruction and laboratory work in the characteristics and processing of Printon: masking techniques; and color balance control. Lectures and supervised laboratory work along with "shooting" 4 × 5 color transparencies.



### 8-360. Portrait Photography

Year, 2 credits each semester

ELBRIDGE C. PURDY

A studio and darkroom course that provides opportunity for practice. The student learns through individual guidance the subtleties of fine portrait work. Lighting, posing, composition, processing and re-touching. *Prerequisite:* Practice of Photography II.

### 8-011. Photographic Roundtable

Year, non-credit

ELBRIDGE C. PURDY and OFFICERS

The Roundtable has been formed to provide opportunity for the continued study of photography. The group meets twice each month during the regular school year. One meeting is devoted to constructive analysis of photographic work presented by members; the other meeting is devoted to presentation of information about new developments and techniques in photography and to other topics of current interest. The Roundtable sponsors an Annual Salon.

Registration is open to persons who have completed any of the courses in photography offered by the Graduate School. No fee is charged; registration, however, is required.

# Correspondence Program

## COMMITTEE

E. J. PETERSON (Chairman)

ROBERT E. ADCOCK  
LOUISE O. BERCAW  
MARY L. COLLINGS  
CARROLL CORNELIUS  
E. H. DRAHEIM  
KESTER D. FLOCK

CANNON C. HEARNE  
HANS S. HOIBERG  
R. A. HOLLIS  
JAMES L. ROBINSON  
JAMES H. STARKEY  
WILLIAM T. WOLFREY, JR.

The following courses are open to qualified field employees of the Federal Government and to others as facilities permit. Persons who wish further information or who wish to register in one of the courses should write to the Registrar, U. S. Department of Agriculture Graduate School, Washington 25, D. C.

### 125C. Basic Lettering

1 credit (7 lessons)

EUGENE MAY

Designed to familiarize the student with the fundamentals of lettering with applications to soil survey charts and maps. Topics covered are basic strokes, spacing, use of the contour pen, and lettering of symbols on aerial photographs. *Cost:* \$9 plus \$5 supplies and postage fee (does not include lettering tools).

### 326C. Report Writing

2 credits (16 lessons)

JAMES PICKENS

A practical course designed to aid members of the field forces in preparing memoranda and reports to administrative heads. The fundamentals of English composition are briefly and simply treated, and special attention is given to clear, concise, orderly, informative presentation and to avoiding the more common faults of expression. *Cost:* \$18 plus \$5 supplies and postage fee, plus the text.

### 316C. Soils and Soil Management

2 credits (15 lessons)

DAVID GARDNER  
J. GORDON STEELE

Practical aspects of soil management. Physical, chemical, and biological properties of soils. How soils are formed. Soils of different places. How soils are changed by erosion, depletion, and improvement. Management of soils for good production and for their conservation and improvement. *Prerequisite:* Chemistry equivalent to that covered in high school. Students who lack a background of at least high-school chemistry should expect to do extra reading. Preparation in physics is helpful but not essential. *Cost:* \$18 plus \$5 supplies and postage fee, plus text.

### 321C. Farm Forestry

2 credits (16 lessons)

JOHN F. PRESTON

A course in the growing of wood as a farm crop. Principles of forestry as integrated with the farm business, and as contrasted with commercial forestry. The management of woods on the farm; development of a farm woodland enterprise. Designed to assist those who teach agriculture or assist farmers in its practice, professional foresters, and farmers to apply forestry techniques to the special problems of growing wood as a farm crop. Students should have access to a farm woodlot since some of the lessons require actual observation. *Cost:* \$18 plus \$5 supplies and postage fee, plus text.

**414C. Federal Personnel Procedure**

2 credits (16 lessons)

VERNA C. MOHAGEN

A course in basic practices and procedures designed to accomplish appointment, transfer, promotion, demotion, separation, and retirement of Federal employees. The course has three objectives: (1) to keep abreast of current developments in personnel procedures; (2) to become familiar with the legal and administrative background of such procedures (statutes, executive orders, decisions of the Comptroller General, the Civil Service Commission, Administrative Orders, etc.); and (3) to visualize the constant need for streamlining procedures in the interests of simplicity and efficiency. *Cost:* \$18 plus \$7.50 supplies and postage fee.

**513C. Statistical Methods in Biology and Agriculture**

2 credits (16 lessons)

JACOB LIEBERMAN and ASSOCIATES

This course uses Snedecor's textbook "Statistical Methods," and follows its outline largely but not absolutely. Each of the 15 lessons consists of narrative material, textbook assignments, questions, and problems. The reports are returned with corrections and comments. Subjects discussed include simple variation, regression and correlation, analysis of variance and covariance, chi-square, multiple and curvilinear correlation, applications to sampling and experimental design. Practical application of methods is kept to the front. Facility in the use of arithmetic and simple algebra is necessary. *Cost:* \$20 plus \$5 supplies and postage fee, plus text.

**521C. Sampling and Experimental Design**

2 credits (15 lessons)

F. M. WADLEY

Students enrolling in this course should have a genuine practical interest in experimentation, and some facility in statistical calculations, including analysis of variance as shown by texts like Snedecor's or Goulden's. The course is intended to give the student an introduction to basic concepts, some practice in applying them, and some acquaintance with the literature opening the way to further study. The philosophy and fundamentals are first treated, with some attention to elementary sampling principles. Next are presented lessons on simpler practical designs, as to use and analysis of results. Last come lessons on factorial design, confounding and more complex experiments, including incomplete block designs. "Experimental Designs," by Cochran and Cox, is used as a text, with some supplementary discussion. *Cost:* \$20 plus \$5 supplies and postage fee, plus text.

**533C. Hydrology**

2 credits (16 lessons)

MAX KOHLER and ASSOCIATES

Review of elementary hydraulic principles basic to a study of flow in natural channels. The phenomena of meteorology which control climate. Methods of collecting data essential to hydrology. The physical characteristics of the land which control the disposition and movement of the earth's water. *Prerequisite:* Physics and algebra. Elementary meteorology, statistics, and engineering are desirable, but not required. *Cost:* \$20 plus \$5 supplies and postage fee, plus text.

**580C. Social and Economic History of Agriculture**

2 credits (16 lessons)

WAYNE D. RASMUSSEN

Introduction; the geographical basis; indigenous and foreign contributions; agrarian colonization and settlement; land policies; agricultural development by periods, regions, and commodities; farm implements and machinery; labor; tenancy; financing farming operations; transportation and marketing of agricultural products; migration of industries from farm to factory; farmers political move-

ments; agencies promoting agriculture, including individual leadership, societies, fairs, periodicals, State and Federal departments, education, and sciences; agriculture in the life of the Nation. *Cost*: \$20 plus \$9 supplies and postage fee.

### **662C. Federal Meat Inspection and Animal Quarantine Laws**

2 credits (16 lessons)

LOWELL MILLER

A study of the history, constitutionality, and provisions of the Federal Meat Inspection Act and related legislation, and the Animal Quarantine statutes, with particular reference to the law of search and seizure, affidavits, hearsay and other rules of evidence. The course is intended as an aid to administrative officials. No previous legal training is required. *Cost*: \$18 and \$6 supplies and postage fee.

### **663C. Legal Aspects of Investigations—Criminal Evidence and Procedure**

2 credits (16 lessons)

JAMES D. FORBES

Designed to provide investigative personnel and those desiring to prepare for such work, a background and insight into the legal aspects of their investigations: what types of evidence to seek; circumstances and conditions under which the evidence is to be obtained in order to have adequate probative value; and how to prepare such evidence for presentation in court or other procedure. Since all investigations are potential sources of prosecution, the requirements of criminal evidence and procedure often reach into the early stages of investigation. The instruction is designed to provide understandable information without overemphasis of technical aspects. *Prerequisite*: Experience in some type of investigative work. *Cost*: \$20 plus \$7 supplies and postage fee.



# Faculty

## FACULTY, DEPARTMENTAL AND SPECIAL COMMITTEES

The year following the name represents the first year of association with the Graduate School.

- ABERDEEN, ESTHER J., (1950) Ph.D., Chicago. Geologist, U. S. Geological Survey, Department of Interior. Taught at Chicago, Milwaukee-Downer, Northwestern and Wellesley. (Physical Sciences)
- ABRAHAMSEN, MARTIN A., (1950) Ph.D., Wisconsin. Principal Agricultural Economist, Farm Credit Administration, USDA. Taught at West Virginia and North Carolina State College of Agriculture and Engineering. (Social Sciences)
- ACKER, LAURENCE W., (1946) C.P.A., Deputy Chief, Army Audit Agency. Taught at Tyler Commercial College. (Public Administration)
- ACKERMAN, CLARA B., (1950) M.A., George Washington. Editor, Extension Service Review, Extension Service, USDA. (Committee on Information)
- ADAMS, EVA B., (1949) LL.B., American. Administrative Assistant to Senator McCarran of Nevada, U. S. Senate. Taught at Nevada. (Public Administration)
- ADCOCK, ROBERT E., (1949) M.S., Oklahoma A. and M. Chief, Training Section, Production and Marketing Administration, USDA. Taught at Oklahoma A. and M. and Cameron State Agricultural College. (Committee on Correspondence Study and Extension Education)
- ADELSON, SADYE F., (1949) M.A., California. Food Economist, Bureau of Human Nutrition and Home Economics, USDA. (Technology)
- ALBEE, GEORGE W., (1951) Ph.D., Pittsburgh. Assistant Executive Secretary, American Psychological Association. Taught at Pittsburgh. (Social Sciences)
- ALLIN, BUSHROD W., (1939) Ph.D., Wisconsin. Chairman, Outlook and Situation Board, Bureau of Agricultural Economics, USDA. Taught at Wisconsin. (Social Sciences)
- AMES, ALVIN G., (1952) M.A., Ohio State. Forms and Reports Management Officer, Bureau of Yards and Docks, Department of the Navy. (Office Techniques and Operations)
- ANDERSON, LOUIS H., (1945) LL.B., Washington College of Law. Technical Assistant, Field Service Division, Government Printing Office. (Languages and Literature)
- APPLEMAN, PAUL L., (1946) Examiner in Accounting, Examining and Placement Division, Civil Service Commission. (Public Administration)
- ARNOULD, JACK C., (1948) LL.M., University of Paris. Assistant to the Air Attache, French Embassy. Taught at Georgetown. (Languages and Literature)
- ASKEGAARD, DAVID, (1950) B.S., North Dakota State. Assistant Director, Southeast Electric Distribution Area Office, Rural Electrification Administration, USDA. (Technology)
- AYLESWORTH, PHILIP F., (1949) M.S., Purdue. Assistant to the Assistant Secretary, Office of the Secretary, USDA. (Social Sciences)
- BACHMAN, KENNETH L., (1950) Ph.D., Harvard. Head, Farm Classification and Analysis Section, Bureau of Agricultural Economics, USDA. (Social Sciences)
- BAHN, CATHERINE I., (1953) M.A., Columbia. Geographer, Aeronautical Chart and Information Service, Department of the Air Force. Taught at Columbia. (Technology)
- BAKER, GLADYS L., (1945) Ph.D., Chicago. Agricultural Historian, Bureau of Agricultural Economics, USDA. (Public Administration)
- BALDAUF, TONY M., (1951) Chief, Procurement Management Section, Office of Budget and Finance, USDA. (Office Techniques)
- BALL, RICHARD C., (1950) Photo-lithographer Supervisor, Office of Plant and Operations, USDA. Formerly Dean of Instruction, Photo-Tech Institute, Salt Lake City. (Technology)
- BAMFORD, RONALD, (1949) Ph.D., Columbia. Dean of Graduate School, University of Maryland. (Biological Sciences)
- BARTLETT, L. GEORGE, (1947) C.P.A., B.C.S., Southeastern. Reviewing Examiner, Farm Credit Administration, USDA. (Committee on Internal Audit)
- BAUER, MAGNA E., (1943) Auguste Victoria Lyzeum, Berlin. Chief of Research Section, Office of the Chief of Military History, Department of the Army. (Languages and Literature)
- BEALES, JAMES A., (1948) Chief, International Press Service, International Information Administration, Department of State. (Technology)
- BEAR, N. ROBERT, (1948) B.S., Ohio State. Chief, Division of Organization and Personnel Management, Office of Personnel, USDA. Taught at Ohio State and Michigan State. (Public Administration)
- BEARDSLEY, KATHERINE PEASE, (1953) Ph.D., Columbia. Lecturer, American University. Taught at Briarcliff Junior College, Finch Junior College and Columbia. (Social Sciences)
- BEAUCHAMP, GEORGE E., (1944) Ph.D., Northwestern. Educational Consultant, Veterans Administration. Taught at Manchester College, Northwestern, and Nottingham. (Languages and Literature)
- BECK, ROY S., (1953) Ph.D., Cornell. Extension Economist, Extension Service, USDA. (Social Sciences)
- BECKNELL, HARVEY E., (1949) M.A., Columbia. Chief, Division of Training and Utilization, Office of Personnel Administration, Department of Labor. (Public Administration)

- BELL, E. DONALD, (1951) Office of the Vice-President, Operations, Southern Railway System. (Office Techniques)
- BENNEWITZ, ECKHARD, (1952) A.B., Cincinnati. Budget Examiner, Bureau of the Budget. Taught at George Washington and American. (Public Administration)
- BENTON, MILDRED C., (1950) A.B., Washington. Librarian, Naval Research Laboratory. (Public Administration)
- BERCAW, LOUISE O., (1949) Assistant Librarian, USDA. (Committee on Correspondence Study and Extension Education)
- BERNARD, EUDORA K., (1952) Reporter, Ace Reporting Company. Taught at Coastal Business College. (Office Techniques)
- BIERMAN, RUSSELL W., (1953) Ph.D., Harvard. Agricultural Economist, Bureau of Agricultural Economics, USDA. (Social Sciences)
- BISHOPP, F. C., (1941) Ph.D., Ohio State. Assistant Chief, Bureau of Entomology and Plant Quarantine, USDA. Taught at Colorado A. and M. and Maryland. (Biological Sciences)
- BLICKENSERFER, J. P., (1949) Ph.D., Harvard. Editor, U. S. Quarterly Book Review, Library of Congress. Taught at Oklahoma, Washington, Harvard, and Pittsburgh. (Languages and Literature)
- BOGGS, S. W., (1948) M.A., Columbia. Special Adviser on Geography, Department of State. (Committee on Physical Sciences)
- BOLLO, LOUISE E., (1952) A.B., George Washington. Nosologist, Public Health Service, Department of Health, Education and Welfare. (Languages and Literature)
- BOTTS, RALPH R., (1946) B.S., Florida. Principal Agricultural Economist, Bureau of Agricultural Economics, USDA. (Office Techniques; Public Administration; Social Sciences)
- BRASFIELD, KARNEY A., (1952) C.P.A., B.S., Washington University in St. Louis. Associate Director, Accounting Systems Division, General Accounting Office. (Public Administration)
- BREWSTER, JOHN M., (1949) Ph.D., Columbia. Agricultural Economist, Production and Marketing Administration, USDA. Taught at Columbia. (Social Sciences)
- BROWN, DAVID S., (1946) A.B., Maine. Secretary, Public Advisory Board, Mutual Security Agency. Taught at Syracuse. (Public Administration)
- BUCKLEY, JAMES L., (1941) LL.B., Georgetown. Assistant Director of Personnel, USDA. (Public Administration)
- BURROUGHS, ROY J., (1947) Ph.D., Michigan. International Housing Adviser, Housing and Home Finance Agency. Taught at Michigan, Port Huron Junior College, and Michigan State. (Social Sciences)
- BURROWS, GLENN L., (1952) M.A., Michigan State. Statistical Consultant, Bureau of Agricultural Economics, USDA. Taught at Wayne, William and Mary, and Michigan State. (Physical Sciences)
- BUTLER, FRANCES A., (1952) Commercial Teacher, Emerson Institute. Taught at Temple. (Office Techniques)
- BUTLER, K. A., (1949) B.S., Minnesota. Assistant Chief for Administration, Bureau of Animal Industry, USDA. (Public Administration)
- CALLAN, J. A. C., (1949) M.A., Union College. Civil Engineer, Ordnance Department, Department of the Navy. Taught at Union College and Alabama Polytechnic. (Technology)
- CANNON, EDWARD W., (1948) Ph.D., Johns Hopkins. Principal Investigator, Logistics Research Project, George Washington University. Taught at Johns Hopkins, Delaware, and American. (Mathematics and Statistics)
- CARANO, ALDO A., (1953) Color Photographer, Office of Plant and Operations, USDA. (Technology)
- CARLIN, ALBERT V., (1951) B.S., Boston. Chief of Training, U. S. Weather Bureau, Department of Commerce. (Physical Sciences)
- CARLSON, THEODORA E., (1952) A.B., Nebraska. Technical Editor, Foreign Agricultural Service, USDA. (Committee on Publications)
- CASKEY, JAMES E., JR., (1953) A.M., Duke. Chief, Editorial Section, U. S. Weather Bureau, Department of Commerce. Taught at Furman. (Physical Sciences)
- CAVIN, JAMES P., (1938) Ph.D., Harvard. Office of Statistical Standards, Bureau of the Budget. Taught at University of Puerto Rico and Catholic. (Social Sciences)
- CHAPLINE, ROBERT W., (1947) C.P.A. Assistant Chief, Examination Division, Farmers Home Administration, USDA. (Committee on Internal Audit)
- CHENEY, JOHN T., (1952) M.A., California. Chief, Literature Division, Public Library, District of Columbia. (Languages and Literature)
- CHURCHILL, ETHAN D., (1950) Ph.D., Catholic. Ecologist and Photographic Interpretation Consultant. (Technology)
- CLARK, L. B., JR., (1949) Glass Technologist, Naval Research Laboratory, Department of the Navy. (Technology)
- CLARK, L. B., SR., (1930) B.S., California. Engineer, Naval Research Laboratory, Department of the Navy. Taught at California, Catholic, and San Francisco Research Laboratory. (Technology)
- CLEMENTS, FORREST E., (1949) Ph.D., California. Head, Division of Special Surveys, Bureau of Agricultural Economics, USDA. Taught at California, Yale, and Oklahoma. (Social Sciences)
- COBB, EDWARD S., (1947) Head, Specifications and Tests, Naval Photographic Center, Department of the Navy. (Technology)
- COCHRAN, H. DEAN, (1943) B.S., Colorado A. and M. Chief, Division of Personnel Management, Forest Service, USDA. (Public Administration)
- COCHRAN, WILLIAM G., (1946) M.A., Cambridge. Professor of Biostatistics, Johns Hopkins University. Taught at Iowa State and North Carolina. (Mathematics and Statistics)

- COLLINGS, MARY LOUISE, (1952) M.S., Northwestern. In charge, Personnel Training Section, Division of Field Studies and Training, Extension Service, USDA. (Social Sciences)
- COLLINS, EMMETT B., (1946) B.B.A., Emory. Chief, Division of Budgetary and Financial Reports, Office of Budget and Finance, USDA. (Office Techniques)
- COMPTON, LAWRENCE V., (1952) M.A., California. Chief, Biology Division, Soil Conservation Service, USDA. (Biological Sciences)
- COOPER, JOHN C., (1946) A.B., Furman. Deputy Director, Office of Budget and Finance, USDA. (Public Administration)
- CORNELIUS, CARROLL M., (1949) A.B., Illinois. Training Officer, Farmers Home Administration, USDA. (Committee on Correspondence Study and Extension Education)
- CORNFIELD, JEROME, (1940) B.S., New York. Mathematical Statistician, Office of Biometry, National Institutes of Health, Department of Health, Education and Welfare. Taught at Columbia and American. (Mathematics and Statistics)
- CORNSWEET, ALBERT C., (1947) Ph.D., North Carolina. Chief Clinical Psychologist, Washington Regional Office, Veterans Administration. Taught at Brown and North Carolina. (Social Sciences)
- CORRELL, LYNNE M., (1950) M.S., Iowa State. Personnel Officer, Region 7, Forest Service, USDA. (Public Administration)
- CORSON, JOHN J., (1950) Ph.D., Virginia. Management Consultant, McKinsey and Company. Taught at Virginia and American. (Public Administration)
- COUCH, VIRGIL L., (1946) B.S., Kentucky. Director, National Civil Defense Training Center, Federal Civil Defense Administration. Chairman, Arlington County Civil Service Commission. (Office Techniques; Public Administration)
- COWING, AMY G., (1947) B.A., B.Ed., George Washington. Extension Educationist, Division of Field Studies and Training, Extension Service, USDA. (Languages and Literature)
- CURRIER, L. W., (1947) Ph.D., Syracuse. Geologist, U. S. Geological Survey, Department of the Interior. Taught at Idaho, Northwestern, Massachusetts Institute of Technology, Syracuse, Missouri School of Mines. (Physical Sciences)
- DALY, JOSEPH F., (1941) Ph.D., Princeton. Chief, Statistical Methods Section, Office of Assistant Director for Statistical Standards, Bureau of the Census, Department of Commerce. Taught at Catholic University and Princeton. (Mathematics and Statistics)
- DAVIDOW, BERNARD, (1951) Ph.D., Georgetown. Pharmacologist, Food and Drug Administration, Department of Health, Education and Welfare. (Physical Sciences)
- DAVIS, FLOYD E., (1950) M.S., Ohio State. Head, Livestock and Wool Division, International Commodities Branch, Foreign Agricultural Service, USDA. (Social Sciences)
- DAVIS, JOHN CORDON, (1950) M.A., Ohio State. Economist. Taught at Michigan State. (Committee on General Economics; Social Sciences)
- DAVIS, RAYMOND, (1946) Chief, Photographic Technologist Section, National Bureau of Standards, Department of Commerce. (Technology)
- DAWLESS, SMITH, (1953) Editor and Writer, Department of State. Formerly script-writer, Warner Brothers. (Languages and Literature)
- DELANEY, MAURICE S. A., (1948) Assistant Director, Division of Chart Construction, Hydrographic Office, Department of the Navy. (Technology)
- DE LA ROSA, O. A., (1953) M.S., Catholic. Assistant Head Architect, Bureau of Yards and Docks, Department of the Navy. (Technology)
- DELOACH, D. BARTON, (1950) Ph.D., California. Associate Head, Division of Marketing and Transportation Research, Bureau of Agricultural Economics, USDA. Taught at California and Oregon State. (Social Sciences)
- DE MARNE, HENRI, (1948) M.A., Maryland. Master in French, St. Albans, the National Cathedral School for Boys. (Languages and Literature)
- DEMING, W. EDWARDS, (1933) Ph.D., Yale. Specialist in Sampling Procedures, Bureau of the Budget. (Mathematics and Statistics)
- DEVRIES, P. H., (1949) M.A., Michigan. Chief, Commodity Programs Division, Office of Information Services, Production and Marketing Administration, USDA. Taught at Michigan State. (Committee on Publications)
- DEXTER, WAYNE V., (1950) B.S., Kansas State College. Publications Editor (Agricultural and Biological Sciences), Bureau of Agricultural Economics, USDA. (Committee on Information)
- DIX, WALTER, (1952) Civil Engineer, Tennessee Valley Authority. (Technology)
- DODDER, BERNARD T., (1952) M.S., Iowa State. C.P.A. President, Dodder Mutual Insurance Agency and Company, Inc. Lecturer at American University. Taught at George Washington, Maryland, Columbia, Temple and Clarkson. (Public Administration)
- DOLCH, ABBEFORD S., (1946) Transportation Rate Analyst, Anti-Trust Division, Department of Justice. (Social Sciences)
- DONOVAN, HENRY A., (1941) Assistant Chief, Bureau of Agricultural and Industrial Chemistry, USDA. (Office Techniques)
- DORN, HAROLD F., (1948) Ph.D., Wisconsin. Chief, Office of Biometry, National Institutes of Health, Department of Health, Education and Welfare. (Mathematics and Statistics)
- DORRANCE, GRAEME S., (1953) M.A., Queen's University. Assistant Division Chief, International Monetary Fund. Taught at London School of Economics. (Social Sciences)
- DOSTER, JERRY C., (1952). B.A., Davidson. Chief of Employment, Federal Civil Defense Administration. (Public Administration)
- DOYLE, MABEL HUNT, (1947) A.B., Wellesley. Publications Editor and Indexing Consultant, Office of Information, USDA. (Languages and Literature)
- DRAHEIM, E. R., (1945) Ph.D., Cornell. Administrative Officer, Division of Employee Performance and Development, Office of Personnel, USDA. Taught at Minnesota, Cornell, and South Dakota State. (Public Administration)



- DRIBIN, DANIEL M., (1951) Ph.D., Chicago. Analyst, National Security Agency, Department of Defense. Taught at Nebraska and George Washington. (Mathematics and Statistics)
- EDELSON, HOWARD, (1952) M.A., Ohio State. Statistician, Food and Drug Administration, Department of Health, Education and Welfare. Taught at Ohio State. (Mathematics and Statistics)
- EDWARDS, GENIANA R., (1950) M.A., George Washington. Information and Editorial Specialist, Foreign Agricultural Service, USDA. (Languages and Literature)
- EGGER, ROWLAND, (1952) Ph.D., Michigan. Director, Bureau of Public Administration, University of Virginia. Taught at Princeton and Columbia. (Public Administration)
- ELEY, LYNN W., (1953) Ph.D., Iowa. Administrative Assistant, Office of Budget and Finance, USDA. (Public Administration)
- ELLER, JEROME N., (1953) B.A., St. John's. Administrative Assistant to Representative Marshall of Minnesota, U. S. House of Representatives. (Public Administration)
- ELLIS, N. R., (1952) M.S., Wisconsin. Biochemist, In Charge, Animal Nutrition Investigations, Bureau of Animal Industry, USDA. (Biological Sciences; Agricultural Research Center Committee)
- ELLSWORTH, GERMAN S., (1950) LL.B., George Washington. Assistant to the Commissioner, Management Planning, Bureau of Reclamation, Department of the Interior. (Public Administration)
- EMERY, WALTER B., (1945) Ph.D., Wisconsin. Consultant, Joint Committee on Educational Television. Taught at Oklahoma, Wisconsin, and Ohio State. (Languages and Literature)
- ENGBERG, RUSSELL C., (1946) Ph.D., Columbia. Chief, Economic and Credit Analysis Division, Farm Credit Administration, USDA. Taught at Iowa State, Minnesota, and Idaho. (Social Sciences)
- ETIENNE, MARGUERITE, (1951) B.A., Rennes. Instructor, George Washington University. (Languages and Literature)
- EVERETT, GEORGE H., (1946) C.E., Clarkson College of Technology. Cartographic Engineer, U. S. Coast and Geodetic Survey, Department of Commerce. Taught at American Institute, Bolivia. (Technology)
- FINDLAY, JOSEPH P., (1947) A.B., George Washington. Assistant Chief, Division of Classification, Office of Personnel, USDA. (Public Administration)
- FINLEY, CYRUS, (1951) Chief, Planning Branch, Operations and Planning Staff, Army Map Service, Department of the Army. (Technology)
- FITEZ, GERALDINE M., (1952) M.A., George Washington. Administrative Assistant to Secretary of Defense Commission, National Education Association. (Office Techniques)
- FITZPATRICK, RICHARD S., (1947) M.A., American. Chief, Evaluations Branch, International Press Service, International Information Administration, Department of State. (Social Sciences)
- FLAVIN, THOMAS J., (1946) LL.B., Georgetown. Judicial Officer, Office of the Secretary, USDA. Taught at Georgetown. (Public Administration)
- FLINCHUM, VIVIAN W., (1951) B.S., Mary Washington. Training Specialist, U. S. Air Force, Department of Defense. (Office Techniques)
- FLOCK, KESTER D., (1951) M.A., American. Training Officer, Forest Service, USDA. (Committee on Correspondence Study and Extension Education)
- FONFARA, EDWARD W., (1950) Cartographic Engineer, Hydrographic Office, Department of the Navy. (Technology)
- FONTAINE, THOMAS D., (1950) Ph.D., Pittsburgh. Head, Biologically Active Chemical Compounds Division, Bureau of Agricultural and Industrial Chemistry, USDA. (Agricultural Research Center Committee)
- FOOTE, RICHARD J., (1940) M.S., Iowa State. Analytical Statistician, Bureau of Agricultural Economics, USDA. (Mathematics and Statistics)
- FORBES, JAMES D., (1950) LL.B., Southeastern. Attorney Advisor, Office of the Solicitor, USDA. (Correspondence)
- FORSYTHE, WILLIAM J., (1950) Information Specialist, Press Service, Office of Information, USDA. (Technology)
- FRANCIS, GERALD M., (1952) Ph.D., Illinois. Business Economist, Department of Commerce. Taught at Denver, Rockford, Western Reserve, and Illinois. (Social Sciences)
- FRENCH, PATTERSON, (1949) Ph.D., Columbia. Technical Assistance Officer, International Bank for Reconstruction and Development. (Public Administration)
- FRETTS, CARL A., (1946) C.P.A., B.S., Pittsburgh. Chief, Finance Division, Federal Crop Insurance Corporation, USDA. Taught at Pittsburgh. (Committee on Internal Audit)
- FRIED, MAURICE, (1953) Ph.D., Purdue. Soil Scientist, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at Purdue. (Languages and Literature)
- FRISCHKNECHT, REED L., (1953) Ph.D., Utah. Consultant, Office of the Secretary, USDA. Taught at Washington and Utah. (Public Administration)
- FRITZ, SIGMUND, (1953) M.S., Massachusetts Institute of Technology. Meteorologist, U. S. Weather Bureau. Taught at National. (Physical Sciences)
- FROLICH, LOUISE A. K., (1952) M.A., Columbia. Captain, WMSC; Chief, Training Branch, Food Service Division, Walter Reed Army Hospital. (Technology)
- FRUTCHY, FREDERICK P., (1945) Ph.D., Ohio State. In Charge, Foreign Students Program, Division of Field Studies and Training, Extension Service, USDA. Taught at Ohio State and Missouri. (Social Sciences)
- FUCHS, R. H., (1949) A.B., American. Accountant. (Office Techniques)



- GALLUP, GLADYS G., (1946) Ed.D., George Washington. In charge, Research and Training Center Section, Extension Service, USDA. Taught at Louisiana, Tennessee, North Carolina, Virginia, Maryland, Florida, Colorado A. and M., Oregon State, and Washington State. (Committee on Internship Cooperation; Social Sciences)
- GARDNER, DAVID, (1953) M.P.A., Harvard. Assistant to the Chief, Soil Survey, Soil Conservation Service, USDA. (Physical Sciences)
- GARVER, HARRY L., (1946) E.E., Washington State. Agricultural Engineer, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. (Technology)
- GEHRING, J. H., (1949) C.E., Rutgers. Manager, Ordnance Facilities Branch, Bureau of Yards and Docks, Department of the Navy. (Technology)
- GEISLER, MURRAY A., (1948) M.A., Columbia. Acting Deputy Chief, Planning Research Division, Office of Comptroller, Department of the Air Force. (Mathematics and Statistics)
- GETTINGER, LILLI, (1952) Studied at Archipenko School of Art and Corcoran School of Art. Taught at Corcoran School of Art, Creative Art Studio and Washington Workshop. (Technology)
- GILL, WILLIAM A., (1950) The William Gill Company, Management Consultants. (Public Administration)
- GILSTRAP, MARGUERITE, (1948) B.S., Arkansas. Information Specialist, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at Arkansas. (Languages and Literature)
- GLASER, EZRA, (1952) M.A., Columbia. Chief, Interindustry Economics Research Staff, Bureau of the Budget. (Social Sciences)
- GLOVER, EARL R., (1951) M.S., Texas A. and M. Assistant to the Assistant Administrator for Marketing, Production and Marketing Administration, USDA. (Committee on Internship Cooperation)
- GOLDSTEIN, HYMAN, (1953) Ph.D., Columbia. Chief, Current Reports Section, Biometrics Branch, National Institute of Mental Health, Department of Health, Education, and Welfare. (Mathematics and Statistics)
- GOODRICK, M. GEORGE, (1953) M.A., Columbia. Director, Division of Management Research, Office of the Secretary of the Interior. Taught at Northwestern, DePaul, and American. (Public Administration)
- GOODSELL, WYLLIE D., (1939) Ph.D., Iowa State. Head, Costs and Returns Section, Division of Farm Management and Costs, Bureau of Agricultural Economics, USDA. Taught at Iowa State. (Social Sciences)
- GRANT, CHARLES L., (1943) Chief, Division of Estimates and Allotments, Office of Budget and Finance, USDA. (Office Techniques; Public Administration)
- GRAY, THOMAS I., JR., (1949) B.S., Arkansas State. Meteorologist, Weather Bureau, Department of Commerce. Taught at Arkansas State. (Physical Sciences)
- GROFF, ELLEN S., (1951) M.A., Columbia. Member of Staff, Hannah Harrison School; Visiting Lecturer, Howard University. (Office Techniques)
- GROSSE, ROBERT N., (1953) Ph.D., Harvard. Economist, Bureau of the Budget. Taught at Bowdoin, Bates, and Rutgers. (Social Sciences)
- GUIDRY, NELSON P., (1947) Geographer, Foreign Agricultural Service, USDA. (Technology)
- HAGOOD, MARGARET JARMAN, (1943) Ph.D., North Carolina. Head, Division of Farm Population and Rural Life, Bureau of Agricultural Economics, USDA. Taught at North Carolina. (Mathematics and Statistics; Social Sciences)
- HAINSWORTH, R. G., (1938) M.A., American. Principal Economic Geographer, Foreign Agricultural Service, USDA. (Mathematics and Statistics; Technology)
- HALL, H. DUNCAN, (1947) B.L.H., Oxford. Historical Adviser, British Embassy. Taught at Harvard and Sydney. (Social Sciences)
- HALLER, H. L., (1933) Ph.D., Columbia. Assistant Chief, Bureau of Entomology and Plant Quarantine, USDA. Taught at Columbia. (Biological Sciences)
- HANSEN, MORRIS H., (1939) M.A., American. Assistant Director for Statistical Standards, Bureau of the Census, Department of Commerce. Taught at American. (Mathematics and Statistics)
- HARDING, EDWARD W., (1950) M.S., Syracuse. Consular Management Adviser, Office of Security and Consular Affairs, Department of State. (Public Administration)
- HARMAN, SUSAN E., (1937) Ph.D., Johns Hopkins. Professor of English, University of Maryland. Taught at Nebraska State Teachers College (Peru). (Languages and Literature)
- HARRIS, WILLIAM S., (1946) M.S., Columbia. Chief, Management Improvement Division, Production and Marketing Administration, USDA. (Office Techniques)
- HASEL, AUSTIN A., (1951) B.S., Michigan. Mathematical Statistician, Forest Service, USDA. (Mathematics and Statistics)
- HAWKINS, HARRY F., JR., (1953) A.M., Temple. Forecaster, U. S. Weather Bureau, Department of Commerce. Taught at Temple and New York. (Physical Sciences)
- HAYGOOD, TYLER F., (1947) Ph.D., Wisconsin. Principal Economist, Division of Agricultural Finance, Bureau of Agricultural Economics, USDA. Taught at Illinois, Wisconsin, Louisville, and West Virginia. (Social Sciences)
- HAYNES, PARKE G., (1950) Chief, Division of Employment, Office of Personnel, USDA. (Committee on Internship Cooperation)
- HEARNE, CANNON C., (1948) M.S., Wisconsin. Head, Division of Extension Education and Training, Technical Cooperation Branch, Foreign Agricultural Service, USDA. Taught at Missouri. (Committee on Correspondence Study and Extension Education; Social Sciences)

- HENDERSON, C. O., (1942) M.S., Cornell. Chief, Employee Performance and Development, Office of Personnel, USDA. (Public Administration)
- HENDRICKS, STERLING B., (1928) Ph.D., California Institute of Technology. Head Chemist, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at Kansas State. (Biological Sciences)
- HENDRICKS, WALTER A., (1947) M.A., George Washington. In Charge, Methodology Section, Agricultural Estimates, Bureau of Agricultural Economics, USDA. Taught at North Carolina State. (Mathematics and Statistics)
- HENSLEY, MARTHA L., (1950) M.S., Kansas State. Home Economist, Bureau of Human Nutrition and Home Economics, USDA. Taught at Illinois and Montana State. (Technology)
- HERREN, RONALD E., (1952) B.C.S., Columbus. Assistant Fiscal Officer, Office of the Administrator, Housing and Home Finance Agency. (Office Techniques and Operations)
- HESS, SIDNEY M., (1950) Ph.D., Georgetown. Biochemist, Food and Drug Administration, Department of Health, Education and Welfare. (Physical Sciences)
- HICKEY, THOMAS J., (1943) LL.M., Columbus University. Deputy Comptroller, Bureau of Medicine and Surgery, Department of the Navy. (Office Techniques)
- HIGGINSON, W. S., (1946) M.A., Utah. Chief, Multiplex Unit, Photogrammetric Section, U. S. Geological Survey, Department of the Interior. Taught at George Washington. (Technology)
- HILBERT, G. E., (1950) Ph.D., Yale. Chief, Bureau of Agricultural and Industrial Chemistry, USDA. (Public Administration)
- HILTS, H. E., (1949) C.E., Pennsylvania. Deputy Commissioner, Programs and Design Division, Bureau of Public Roads, Department of Commerce. (Technology)
- HOBBS, MARGARET O., (1950) A.B., George Washington. Teacher, Calvin Coolidge High School. (Office Techniques)
- HODGSON, RALPH E., (1947) Ph.D., Wisconsin. Assistant Chief, Bureau of Dairy Industry, USDA. (Biological Sciences)
- HOIBERG, HANS S., (1949) M.A., Columbia. Training Officer, Rural Electrification Administration, USDA. (Committee on Correspondence Study and Extension Education)
- HOLDEN, JOHN, (1951) Chief, Division of Procurement and Property Management, Office of Budget and Finance, USDA. (Public Administration)
- HOLLIS, RICHARD A., (1950) Associate Chief, Inquiries and Distribution Service, Office of Information, USDA. (Committee on Correspondence Study and Extension Education)
- HOLT, CLAIRE, (1952) Staff member of School of Advanced and Specialized Studies, Foreign Service Institute, Department of State. Taught at Columbia and Strategic Intelligence School. (Social Sciences)
- HOOKS, LANCE G., (1951) Assistant Chief, Division of Marketing Programs, Office of Information Services, Production and Marketing Administration, USDA. (Technology)
- HORD, WARNER H., (1945) M.B.A., Harvard. Chief, Accounting and Statistics Division, Bureau of Air Operations, Civil Aeronautics Board. Taught at Tulane. (Public Administration)
- HORNBECK, STANLEY K., (1948) Ph.D., Wisconsin. Former Chief, Division of Far Eastern Affairs, Department of State, and former Ambassador to the Netherlands. Taught at Chinese Government Colleges, Michigan, and Harvard. (Social Sciences)
- HORTON, DONALD C., (1940) Ph.D., Michigan. Economist, Division of Resources and Civil Works, Bureau of the Budget. Taught at Ohio State, Michigan, Brown, and Wisconsin. (Social Sciences)
- HORWITZ, WILLIAM, (1951) Ph.D., Minnesota. Chief of Dairy and Cereal Branch, Division of Food, Food and Drug Administration, Department of Health, Education and Welfare. (Public Administration)
- HOUSEMAN, EARL E., (1951) M.A., South Dakota. Statistical Assistant, Office of the Chief, Bureau of Agricultural Economics, USDA. (Mathematics and Statistics)
- HOWE, PAUL E., (1924) Ph.D., Illinois. Nutrition Consultant, Bureau of Animal Industry, USDA. Taught at Columbia. (Biological Sciences)
- IRVING, GEORGE W., JR., (1946) Ph.D., George Washington. Assistant Chief, Bureau of Agricultural and Industrial Chemistry, USDA. Taught at Cornell Medical School and George Washington. (Committee on Internship Cooperation)
- JACOBS, WOODROW C., (1942) Ph.D., California. Director of Climatology, Air Weather Service, Department of the Air Force. Taught at California and Massachusetts Institute of Technology. (Physical Sciences)
- JAFFE, ERWIN, (1947) Ph.D., Harvard. Chief, Flight Information Division, Office of Aviation Information, Civil Aeronautics Administration, Department of Commerce. Taught at Harvard. (Languages and Literature)
- JEBENS, ARTHUR B., (1953) J.D., Ohio. Director of Management Research, Office of the Administrative Assistant Secretary, Department of the Interior. (Public Administration)
- JESSEL, J. J. A., (1942) D.Sc., Harvard. Principal Electrical Engineer, Bureau of Power, Federal Power Commission. Taught at Harvard. (Technology)
- JOHNSON, EDWARD C., (1947) LL.B., George Washington. Hearing Examiner, Securities and Exchange Commission. Taught at Southeastern. (Public Administration)
- JOHNSON, NELSON TRUSLER, (1947) Formerly Secretary-General, The Far Eastern Commission, Minister to Australia, Assistant Secretary of State, and Ambassador to China. (Social Sciences)

- JOHNSON, SHERMAN E., (1937) Ph.D., Harvard. Assistant Chief for Production Economics, Bureau of Agricultural Economics, USDA. Taught at Minnesota, Montana State, and South Dakota State. (Social Sciences)
- JOHNSON, V. WEBSTER, (1941) Ph.D., Wisconsin. Land Reform Advisor, Mutual Security Agency. Taught at Maryland, North Dakota State, Syracuse, and Virginia. (Social Sciences)
- JOHNSTON, CARTER D., (1946) Ph.D., Chicago. Pharmacologist, Division of Pharmacology, Food and Drug Administration, Department of Health, Education and Welfare. Taught at Chicago. (Physical Sciences)
- JOHNSTON, HELEN L., (1951) A.B., Nebraska. Health Economist, Public Health Service, Department of Health, Education and Welfare. (Social Sciences)
- JOHNSTON, MARJORIE C., (1942) Specialist, Comparative Education, American Republics, Division of International Education, Office of Education, Department of Health, Education and Welfare. Taught at Texas, Stephens College, George Washington, and San Diego State. (Languages and Literature)
- JOSEPHSON, H. R., (1949) Ph.D., California. Chief, Division of Forest Economics, Forest Service, USDA. Taught at California. (Social Sciences)
- JOY, BARNARD, (1953) Ed.D., George Washington. Assistant to the Administrator, Agricultural Research Administration, USDA. (Committee on Cooperative Extension Education)
- KAPLAN, LEWIS D., (1952) Ph.D., Chicago. Meteorologist, Weather Bureau, Department of Commerce. Taught at New Mexico and Chicago. (Physical Sciences)
- KAPLAN, SIDNEY, (1948) M.A., Brooklyn. Mathematician, Planning Research Branch, Office of the Comptroller of The Army. Taught at Brooklyn, Johns Hopkins, and Catholic. (Mathematics and Statistics)
- KAUFHOLZ, FERDINAND, (1949) B.C.E., Johns Hopkins. Deputy Regional Director, Public Buildings Service, General Services Administration. (Technology)
- KAUFMAN, MILTON, (1940) M.S., City College of the City of New York. Survey Statistician, Bureau of the Census, Department of Commerce. (Mathematics and Statistics)
- KEILES, ELSA O., (1945) D.Sc., Johns Hopkins. Principal Biochemist, Division of Research Grants, National Institutes of Health, Department of Health, Education and Welfare. (Physical Sciences; Agricultural Research Center Committee)
- KELSEY, RAY A., (1953) B.Sc.CE., Nebraska. Photogrammetric Engineer, Engineering Research and Development Laboratories, Department of the Army. (Technology)
- KING, J. E., (1948) Chief, Cartographic Section, Division of Engineering, Forest Service, USDA. (Technology)
- KING, SHERWOOD, (1953) Chief, Features Unit, Far East Press Section, International Information Administration, Department of State. Taught at New York. (Languages and Literature)
- KIRK, DUDLEY, (1951) Ph.D., Harvard. Advisor, Social and Demographic Research, Office of Intelligence Research, Department of State. Taught at Harvard and Princeton. (Social Sciences)
- KLEM, MARGARET C., (1947) A.B., Rochester. Public Health Administrator, Division of Occupational Health, Public Health Service, Department of Health, Education and Welfare. (Social Sciences)
- KOEBEL, RALPH F., (1943) S.J.D., Georgetown. Chief, General Legal Services Division, Office of the Solicitor, USDA. (Public Administration)
- KOHLER, MAX A., (1950) B.S., New Mexico. Chief Research Hydrologist, Weather Bureau, Department of Commerce. (Physical Sciences; Correspondence)
- KOTSCHNIG, WALTER M., (1948) Dr. Political Science, University of Kiel, Germany. Director, Office of United Nations Economic and Social Affairs, Department of State. (Social Sciences)
- KRAMER, WILLIAM P., (1949) B.S., Pennsylvania State. Formerly, Chief, Division of Operation, Forest Service, USDA. (Office Techniques)
- KRIESBERG, MARTIN, (1952) Ph.D., Harvard. Marketing Specialist, Production and Marketing Administration, USDA. Taught at American. (Public Administration)
- KUSNER, JOSEPH H., (1949) Ph.D., Pennsylvania. Chief, Program Management Division, Munitions Board, Office of the Secretary of Defense. Taught at Pennsylvania and Florida. (Mathematics and Statistics)
- LAMPHERE, WILLARD H., (1952) B.S., Idaho. Chief, Division of Production Programs, Office of Information Services, Production and Marketing Administration, USDA. (Committee on Information)
- LANCASTER, OTIS E., (1950) Ph.D., Harvard. Head, Applied Mathematics Branch, Research Division, Bureau of Aeronautics, Department of the Navy. Taught at Harvard and Maryland. (Mathematics and Statistics)
- LANDIS, SAMUEL E., (1953) B.A., George Washington. Organization and Methods Examiner, Department of the Navy. (Office Techniques)
- LANDO, ROBERT H., (1947) M.A., California. Management Planning Officer, Bureau of Agricultural Economics, USDA. (Office Techniques)
- LANG, C. C., (1953) B.S., Ohio State. Associate Leader, 4-H Club and YMW Programs, USDA. (Committee on Cooperative Extension Education)
- LAPHAM, LEWIS J. (1952) M.S., Syracuse. Administrative Assistant, Military Operations Subcommittee, House Committee on Government Operations. Taught at Florida State. (Public Administration)
- LARRIMER, WALTER H., (1949) Ph.D., Ohio State. Staff Assistant, Branch of Research, Forest Service, USDA. (Committee on Internship Cooperation)



- LA RUE, GEORGE R., (1953) Ph.D., Illinois. Visiting Investigator, Bureau of Animal Industry, USDA. Taught at Michigan and Rice Institute. (Biological Sciences)
- LASSWELL, HAROLD, (1946) Ph.D., Chicago. Professor, Yale School of Law. Taught at Chicago. (Social Sciences)
- LAXTON, WILLIAM C., (1946) A.B., George Washington. Chief, Division of Classification, Office of Personnel, USDA. (Public Administration)
- LAZZARI, PIETRO, (1944) Master Artist, Ornamental School of Rome. Belle Arti. Portrait artist, landscape painter, and graphic designer. Taught at American and Beaux Arts Institute of Design, New York. (Technology)
- LEAVENS, DONALD C., (1951) Ph.M., Wisconsin. Office of the Undersecretary of Transportation, Department of Commerce. (Social Sciences)
- LECLERG, E. L., (1949) Ph.D., Minnesota. Research Coordinator, Agricultural Research Administration, USDA. (Biological Sciences)
- LEDERER, MARIANNE, (1947) Lehramtsprüfung, University of Vienna. Taught in the secondary and higher schools of Vienna. (Languages and Literature)
- LEEDY, DANIEL L., (1950) Ph.D., Ohio State. Biologist in Charge of Cooperative Wildlife Research Units, Fish and Wildlife Service, Department of the Interior. (Biological Sciences)
- LEFEBVRE, R. J., (1946) B.Ch., New York. Chief, GPO—Department of State Service Office. (Technology)
- LEGGETTE, L. POE, (1952) A.M., North Carolina. Associate Professor of Speech, George Washington University. Taught at Sullins, Marshall, and George Washington. (Languages and Literature)
- LEHMAN, ARNOLD J., (1949) Ph.D., M.D., Stanford. Chief, Division of Pharmacology, Food and Drug Administration, Department of Health, Education and Welfare. Taught at Washington, Stanford, Oklahoma, and Wayne. (Physical Sciences)
- LEICH, HAROLD H., (1946) A.B., Dartmouth. Chief, Program Planning Staff, Civil Service Commission. (Public Administration)
- LEIFSON, GUNNAR, (1952) B.S., North Dakota State. Head, Survey Branch, Hydrographic Office, Department of the Navy. (Technology)
- LEIKIND, MORRIS C., M.Sc., Ohio State. Chief, Division of Historical Research, Medical Museum, Armed Forces Institute of Pathology. Taught at Ohio State. (Biological Sciences)
- LEVINE, DAVID D., (1948) M.A., Wisconsin. Program Planning Officer, Office of Management, General Services Administration. (Public Administration)
- LEVY, JOSEPH B., (1952) Ph.D., Harvard. Senior Research Associate, Naval Ordnance Laboratory, Department of the Navy. (Physical Sciences)
- LEWIS, EDWARD J., (1952) Head, Reports Management Program, Administrative Office, Department of the Navy. (Office Techniques)
- LEWIS, KEITH B., (1946) A.B., Georgia. Manager, Washington Office, Eastman Kodak Company. (Technology)
- LIEBERMAN, JACOB E., B.S., Brooklyn. Analytical Statistician, National Institutes of Health, Department of Health, Education and Welfare. (Mathematics and Statistics; Correspondence)
- LOFTUS, JOSEPH P., (1946) A.B., St. Mary's College. Chief, Fiscal Management, Office of Budget and Finance, USDA. (Public Administration)
- LOGAN, CHARLES A., (1947) M.S., Kansas State. Superintendent, Office of Operations, Agricultural Research Center, USDA. Taught at Kansas State. (Agricultural Research Center Committee)
- LORING, BLAKE M., D.Sc., Massachusetts Institute of Technology. Metallurgist, Explosives Research Department. Naval Ordnance Laboratory, Department of the Navy. Taught at Massachusetts Institute of Technology. (Physical Sciences)
- LOVERIDGE, EARL W., (1946) B.S.F., Pennsylvania State. Assistant Chief, Forest Service, USDA. (Public Administration)
- LOVVORN, R. L., (1950) Ph.D., Wisconsin. Head, Division of Weed Investigations, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at North Carolina State. (Biological Sciences)
- LUCAS, JOHN S., (1937) Department Security Officer, Office of Plant and Operations, USDA. (Office Techniques and Operations)
- LUTON, JOHNSTON E., (1950) A.B., Union. Chief, Management Improvement Branch, General Services Administration. (Public Administration)
- LUTTRELL, DOROTHY M., (1947) Chief, Records Administration Branch, Office of Price Stabilization, Economic Stabilization Administration. (Office Techniques)
- LYNDE, LYDIA A., (1953) M.S., Purdue. Parent and Family Life Education Specialist, Extension Service, USDA. (Technology)
- LYON, ROWLAND, (1946) M.A., George Washington. Staff Member, National Collection of Fine Arts, Smithsonian Institution. Taught at George Washington. (Technology)
- MABBITT, HARRY F., (1952) B.S., Iowa State. Head, Buildings and Structures Section, Engineering Division, Rural Electrification Administration, USDA. Taught at Iowa State. (Technology)
- MACK, CLIFTON E., (1946) LL.B., Suffolk. Commissioner, Federal Supply Service, General Services Administration. Taught at American. (Public Administration)
- MAGNUSON, HENRY A., (1953) Certificate in Architecture, Massachusetts Normal Art School. Architectural Engineer, Public Buildings Service, General Services Administration. (Committee on Fine Arts and Architecture)



- MANGHAM, F. R., (1952) LL.B., North Texas School of Law. Chief, Administrative Services Division, Soil Conservation Service, USDA. (Public Administration)
- MANLEY, LAWRENCE O., (1949) C.P.A. Certified Public Accountant, Wayne Kendrick and Company. (Public Administration)
- MAPOU, ALBERT, (1951) M.A., George Washington. Psychologist, Testing Branch, U. S. Employment Service, Department of Labor. (Public Administration)
- MARSHALL, HERBERT G., (1946) Supervisory Auditor, Internal Audit Division, General Services Administration. (Public Administration)
- MASON, CHARLES N., (1943) M.A., Montana. Accountant. Taught at Montana. (Public Administration)
- MASON, DAVID D., (1951) Ph.D., North Carolina State. Biometrician, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA. Taught at Virginia Polytechnic Institute and Ohio State. (Mathematics and Statistics)
- MATERAZZI, ALBERT R., (1948) D.Ch., University of Rome. Technical Representative and Research Advisor, Litho Chemical and Supply Company, Inc. (Technology)
- MATTHEWS, JOSEPH L., (1952) Ph.D., Chicago. In Charge, Educational Research Section, Extension Service, USDA. (Social Sciences)
- MAXWELL, ROBERT W., (1946) LL.B., Washington College of Law, American University. Commissioner of Accounts, Department of the Treasury. (Public Administration)
- MAY, EUGENE, (1952) Cartographic Engineer, Soil Conservation Service, USDA. (Correspondence)
- MCCABE, TERRENCE W., (1951) Ph.M., Wisconsin. Economist, Production and Marketing Administration, USDA. (Languages and Literature)
- MCCARTHY, FRANCIS X., (1953) M.A., St. Louis. Chief, Office of Industrial Relations, Bureau of Engraving and Printing. (Public Administration)
- MCCLAREN, J. KENDALL, (1946) Head, Division of Information, Bureau of Animal Industry, USDA. Taught at Northeastern Teachers College. (Languages and Literature; Committee on Publications)
- MCCORMICK, JAMES H., (1946) M.S., Georgetown. Deputy Director, Office of Information, USDA. (Committee on Publications)
- MCHEHENRY, WILLIAM C., (1948) Photographer, National War College, Department of Defense. (Technology)
- MCINTYRE, E. R., (1950) Editor, Office of Information, USDA. (Committee on Information)
- MCINTYRE, RALPH G., (1953) LL.B., Columbus. Assistant Chief, Property Management Section, Office of Budget and Finance, USDA. (Office Techniques and Operations)
- McKENNA, DUANE A., (1952) B.F.A., South Dakota. Art Director, Broadcasting and Telecasting Magazine. (Technology)
- MCLEAN, ARTHUR B., (1942) M.S., Alabama. Chief, Technical Staff Branch, Productivity and Technical Assistance Division, Mutual Security Administration. (Public Administration)
- MCNAMARA, FRED A., (1953) A.B., Harvard. Assistant Chief, Labor and Welfare Division, in Charge of Hospital Programs, Bureau of the Budget. (Public Administration)
- MC SHEA, JOHN F., (1941) C.P.A. Assistant Chief Auditor, Office of Audit, Production and Marketing Administration, USDA. (Committee on Internal Audit)
- MCWHORTER, JESSE B., (1950) M.C.S., Benjamin Franklin. Chief, Estimates Section, Office of Budget and Finance, USDA. (Office Techniques)
- MILEHAM, HARRY P., (1947) M.A., Columbia. Chief of Publications, Office of Information, USDA. (Committee on Publications)
- MILLER, A. R., (1949) D.V.M., Iowa State. Assistant Chief and Chief of Meat Inspection, Bureau of Animal Industry, USDA. (Office Techniques and Operations)
- MILLER, FRANCES H., (1946) M.A., Missouri. Instructor, University of Maryland. (Languages and Literature)
- MILLER, LOWELL E., (1951) J.D., State University of Iowa. Attorney, Office of the Solicitor, USDA. (Correspondence)
- MILLER, ROY E., (1943) B.S., Missouri. Chief, Editorial Section, Division of Publications, Office of Information, USDA. (Languages and Literature)
- MINOR, WILLIAM A., (1946) B.S.A., Georgia. Assistant to the Under Secretary of Agriculture. (Public Administration)
- MOHAGEN, VERNA C., (1942) M.A., George Washington. Chief, Personnel Management Division, Soil Conservation Service, USDA. (Office Techniques)
- MOORE, WILLIAM L., (1948) A.B., Antioch. Chief, Personnel Division, Farm Credit Administration, USDA. (Office Techniques)
- MOSEMAN, ALBERT H., (1947) Ph.D., Minnesota. Chief, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA. (Biological Sciences)
- MOUSER, C. M., (1953) M.A., Louisiana State. Chief Clerk, Senate Committee on Agriculture and Forestry. Taught at Sam Houston State and Northwestern State. (Social Sciences)
- MOYER, EUGENE C., (1946) C.P.A., B.S., Georgetown. Practicing Certified Public Accountant; Adjunct Professor, American. (Public Administration)
- MURPHY, CHARLES D., (1947) Ph.D., Cornell. Professor of English, University of Maryland. (Languages and Literature)
- NEIKIRK, ROBERT S., (1951) B.S.E.E., Purdue. Engineer, Technical Standards Division, Rural Electrification Administration, USDA. (Technology)

- NEWELL, STERLING R., (1929) M.A., American. Assistant Chief for Agricultural Estimates, Bureau of Agricultural Economics, USDA. (Mathematics and Statistics)
- NICHOLS, MARK L., (1950) D.Sc., Clemson. Chief of Research, Soil Conservation Service, USDA. (Physical Sciences)
- NICKERSON, DOROTHY, (1949) Color Technologist, Cotton Branch, Production and Marketing Administration, USDA. (Technology)
- NIKIFOROFF, CONSTANTIN C., (1948) Ph.D., St. Petersburg. Soil Scientist, Soil Conservation Service, USDA. Taught at Minnesota and Maryland. (Physical Sciences)
- NISSelson, HAROLD, (1946) B.S., City College of the City of New York. Chief, Field Methods Research Section, Field Division, Bureau of the Census, Department of Commerce. Taught at American. (Mathematics and Statistics)
- NOLAN, EDWIN T., (1949) B.C.S., Columbus. Assistant Director, Accounting Systems Division, General Accounting Office. (Public Administration)
- NORTON, ETHAN A., (1949) M.S., Illinois. Assistant Chief, Soil Conservation Service, USDA. Taught at Illinois and Texas A. and M. (Committee on Internship Cooperation)
- NOWICKI, ALBERT L., (1948) M.C.E., Minnesota. Chief, Photogrammetric Division, Army Map Service, Department of the Army. (Technology)
- NYSTROM, PAUL E., (1950) D.P.A., Harvard. Director of Instruction, College of Agriculture, University of Maryland. (Social Sciences)
- O'BRIEN, RUTH, (1952) LL.B., George Washington. Assistant Chief, Bureau of Human Nutrition and Home Economics, USDA. Taught at Iowa State. (Committee on Internship Cooperation)
- OLSON, BYRON J., (1952) Ph.D., M.D., Minnesota. Medical Director, Laboratory of Infectious Diseases, National Microbiological Institute, National Institutes of Health, Department of Health, Education and Welfare. (Biological Sciences)
- OLSON, KENNETH W., (1952) M.A., Michigan. Head, Division of Foreign Agricultural Information, Foreign Agricultural Service, USDA. (Languages and Literature)
- ORNSTEIN, JACOB, (1952) Ph.D., Wisconsin. Assistant Professor (On Leave), New Mexico A. and M. Taught at Wisconsin, Waldorf, and Catawba. (Languages and Literature)
- OSBORNE, JAMES G., (1953) B.S., California. Statistical Analyst, Forest Service, USDA. (Mathematics and Statistics)
- PABST, W. R., (1948) Ph.D., Columbia. Chief Statistician, Bureau of Ordnance, Department of the Navy. Taught at Cornell, Amherst, and Tulane. (Mathematics and Statistics)
- PALMER, PIERRE S., (1953) A.B., Chicago. Senior Budget Examiner, Bureau of the Budget. (Public Administration)
- PARKER, MARION W., (1935) Ph.D., Maryland. Head, Rubber Plant Investigations, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at Maryland. (Biological Sciences)
- PARKIN, ERNEST J., (1950) B.S., George Washington. Mathematician, U. S. Coast and Geodetic Survey, Department of Commerce. Taught at Ohio State. (Technology)
- PATTERSON, WILBUR I., (1951) Ph.D., Illinois. Chief, Organic Analytical Methods Branch, Food and Drug Administration, Department of Health, Education and Welfare. (Physical Sciences)
- PEARSON, KAY, (1949) M.A., Alabama. Chief, Correspondence Management Section, Administrative Office, Department of the Navy. (Office Techniques)
- PERRIN, JAMES F., (1946) LL.B., National. Commerce Counsel, Military Traffic Service, Office of the Secretary of Defense. (Social Sciences)
- PERSON, HARLOW S., (1937) Ph.D., Michigan. Consulting Economist, Office of the Administrator, Rural Electrification Administration. Taught at Dartmouth. (Public Administration)
- PETERSON, EUGENE J., (1948) B.S., Wisconsin. Assistant Chief, Personnel Management Division, Soil Conservation Service, USDA. (Committee on Correspondence Study and Extension Education; Office Techniques)
- PICKENS, JAMES, (1944) Technical Editor, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA (retired). Taught at Foyer du Soldat, France. (Correspondence)
- PIKE, HOWLAND, (1950) District Manager, Government Sales, Ansco Division, General Aniline and Film Corporation. (Technology)
- PIQUET, HOWARD S., (1948) Ph.D., Princeton. Senior Specialist, International Trade, Legislative Reference Service, Library of Congress. (Social Sciences)
- POLLOCK, ROSS, (1946) M.A., George Washington. Chief, Examining Program and Standards Branch, Civil Service Commission. (Public Administration)
- PONCE, ODILÓN, (1952) Degree of Professor, University of Córdoba. Translator, Pan American Sanitary Bureau. Taught at Córdoba, Manchester, and North Carolina. (Languages and Literature)
- PONTI, JOSEPH, (1944) M.A., Stanford. Foreign Broadcast Monitor. Taught at University of Freiburg, Bologna, and Maryland. (Languages and Literature)
- POPECKI, JOSEPH T., (1952) B.S.L.S., Catholic. Assistant to the Director of Libraries, Catholic University. Taught at Catholic. (Languages and Literature)
- POSNER, BEN, (1952) M.A., George Washington. Budget Consultant, International Information Administration, Department of State. Taught at Arizona and George Washington. (Public Administration)

- POTTER, WILLIAM D., (1952) B.S., California Institute of Technology. Hydraulic Engineer, Bureau of Public Roads, Department of Commerce. (Technology)
- PRESTON, JOHN F., (1951) M.S.F., Michigan. Chief of Forestry Division, Soil Conservation Service, USDA (retired). (Correspondence)
- PRICE, H. WALTER, (1953) B.S., Drexel Institute of Technology. Electronics Engineer, National Bureau of Standards. (Technology)
- PURDY, ELBRIDGE C., (1943) Master of Photography. Chief, Photographic Section, Service Operations Division, Office of Plant and Operations, USDA. (Technology)
- PURVES, C. M., (1926) M.A., Minnesota. Assistant Chief, Regional Investigation Branch, Foreign Agricultural Service, USDA. Taught at Texas A. & M. (Mathematics and Statistics)
- RADFORD, RICHARD A., (1950) B.A., Cambridge. Research Economist, International Monetary Fund. (Social Sciences)
- RANDALL, RAYMOND L., (1952) A.B., George Washington. Assistant Director of Personnel, Federal Civil Defense Administration. Taught at National Bureau of Standards Graduate School. (Public Administration)
- RANDALL, ROBERT H., JR., (1952) B.C.E., George Washington. Special Assistant for Research and Development, Chief Engineer's Office, U. S. Hydrographic Office, Department of the Navy. (Technology)
- RAPPLEYE, HOWARD S., (1946) Chief, Section of Leveling, Division of Geodesy, U. S. Coast and Geodetic Survey, Department of Commerce (retired). Taught at Columbia, Howard, Maryland, and Catholic. (Technology)
- RASMUSSEN, WAYNE D., (1950) Ph.D., George Washington. Agricultural Historian, Bureau of Agricultural Economics, USDA. (Social Sciences; Correspondence)
- RAUCHSCHWALBE, OTTO, (1950) M.S., Maryland. Research Analyst, American Trucking Association. (Mathematics and Statistics)
- REEVE, ROY M., (1948) Chief, Medical Illustration Service, Armed Forces Institute of Pathology. (Technology)
- REICH, DAVID, (1946) LL.B., Fordham. Attorney at Law. (Public Administration)
- REID, SEERLEY, (1948) Ph.D., Ohio State. Chief, Visual Education Service, Office of Education, Department of Health, Education and Welfare. Taught at Northwestern, Ohio State, and Wisconsin. (Languages and Literature)
- RHODES, JOSEPH S., (1947) M.A., Brooklyn. Mathematical Statistician, U. S. Air Force Comptroller, Department of the Air Force. Taught at Brooklyn, Wisconsin, and George Washington. (Mathematics and Statistics)
- RICE, WILLIAM B., (1952) Program Coordinator, Office Methods Division, Department of the Navy. (Office Techniques and Operations)
- RICHARDS, CHARLES M., (1946) M.A., Columbia. Curator, National Gallery of Art. Taught at Oberlin, Columbia, and Rutgers. (Technology)
- ROBINSON, BEVERLY, (1953) M.S., Michigan. Architect, Architectural Division, Design Section for Construction, Supply and Real Estate, Veterans Administration. (Technology)
- ROBINSON, JAMES L., (1953) M.S., Cornell. Senior Extension Economist, Farm Credit Administration, USDA. (Committee on Correspondence Study and Extension Education)
- ROCKWELL, GEORGE M. KORENEV, (1949) B.S., Columbia. Graduate of Classical Gymnasium, Odessa and Novordsskiy University. Assistant Professor of Russian, Intelligence School, Department of the Navy. Taught at Columbia and New York. (Languages and Literature)
- ROKAHR, MARY A., (1949) M.A., Columbia. Assistant to the Chief, Division of Home Economics Programs, Extension Service, USDA. (Social Sciences; Technology)
- ROMAGNA, JACK, (1943) Administrative Officer (Official Reporter), White House. (Office Techniques)
- ROMERO, FERNANDO, (1951) Ph.D., Universidad de San Marcos. Chief, Vocational Education Section, Pan American Union. Taught at Peruvian Naval Academy and San Marcos. (Languages and Literature)
- ROSEN, S. MCKEE, (1949) Ph.D., London. Chief, Foreign Technical Assistance Group, Bureau of the Budget. (Mathematics and Statistics)
- ROSENBAUM, MARCUS A., (1951) Cartographer, Aeronautical Chart and Information Service, Department of the Air Force. Taught at Northeastern. (Technology)
- ROSENZWEIG, BENJAMIN, (1951) B.S., Ch.E., City College of the City of New York. Standard Engineer, Plans and Controls Division, Defense Supply Management Agency, Office of the Secretary of Defense. (Technology)
- ROSER, VIRGINIA B., (1950) B.A., Emerson. Teacher of Speech. (Languages and Literature)
- ROSSITER, FRED J., (1949) M.S., Iowa State. Associate Director, Foreign Agricultural Service, USDA. Taught at Iowa State. (Social Sciences)
- ROWE, HAROLD B., (1947) B.S., Iowa State. Member, Senior Staff, Brookings Institution. (Social Sciences)
- ROWE, WILLIAM H., (1934) M.S., Kansas State. Chief, Program Development Division, Federal Crop Insurance Corporation, USDA. Taught at Kansas State and Akron. (Public Administration)
- ROWLAND, RALPH, (1948) M.A., Nebraska. Chief, Office Practices Section, Foreign Service Institute, Department of State. Taught at Nebraska and State Teachers College (Indiana, Pennsylvania). (Office Techniques and Operations)
- RUBIN, MEYER, (1951) M.S., Chicago. Military Geology Branch, U. S. Geological Survey, Department of Interior. Taught at Illinois Institute of Technology. (Physical Sciences)



- RUPPERT, M. CLARE, (1947) M.A., George Washington. Coordinator, Adult Services, D. C. Public Library. (Languages and Literature)
- RYAN, WALTER F., (1953) Ph.D., Cornell University. Assistant Chief, Office of Statistical Standards, Bureau of the Budget. Taught at Cornell and Colgate. (Mathematics and Statistics)
- SABROSKY, LAUREL K., (1947) M.S., Kansas State. Extension Analyst, Division of Field Studies and Training, Extension Service, USDA. Taught at Colorado A. and M. (Social Sciences)
- SAHAROV, GEORGE M., (1941) A.B., California at Los Angeles. Graduate of Classical Gymnasium, Tula, Russia. Economic and Statistical Analyst, Bureau of Transport Economics and Statistics, Interstate Commerce Commission. Taught at Southern California. (Languages and Literature)
- SAILER, REECE I., (1947) Ph.D., Kansas. Entomologist, Bureau of Entomology and Plant Quarantine, USDA. Taught at Michigan. (Biological Sciences)
- SAMLER, JOSEPH, (1953) Ph.D., New York. Special Assistant for Operations, Counseling Service Vocational Rehabilitation and Education, Veterans Administration. Taught at American University. (Social Sciences)
- SAMSON, VERNE L., (1942) A.B., Washington State. Training Officer, Public Housing Administration, Housing and Home Finance Agency. Taught at Whitworth and Washington State (Languages and Literature; Office Techniques)
- SAUNDERS, J. A., (1948) B.S., U. S. Naval Academy. Capt., USN (Ret.). Trustee and Lecturer, Institute of General Semantics. (Social Sciences)
- SAWCHUK, HENRY A., (1949) M.S., City College of the City of New York. Chief, Board Advisory Section, Examining and Placement Division, Civil Service Commission. (Technology)
- SCAMMAHORN, JAMES, (1946) Chief, Property and Supply Management Branch, Atomic Energy Commission. (Public Administration)
- SCHAEZNER, J. P., (1949) B.S., Wisconsin. Head Electro-Agriculture Specialist, Operations Division, Rural Electrification Administration, USDA. Taught at Wisconsin. (Technology)
- SCHANTZ, JOSEPH A., (1951) B.A., Toronto. Head, Methods and Processes Division, Naval Photographic Center, Department of the Navy. (Technology)
- SCHLUP, LESTER A., (1947) B.C.S., Southeastern. Chief, Division of Extension Information, Extension Service, USDA. (Languages and Literature)
- SCHOTT, RALPH C., (1947) Ph.D., Iowa State. Animal Husbandman, Bureau of Animal Industry, USDA. Taught at Iowa State, Princeton, Johns Hopkins, and Ohio State. (Agricultural Research Center Committee)
- SCOTT, DUNCAN N., (1951) M.A., Texas. Chief of Features Unit, International Press Service, International Information Administration, Department of State. Taught at New Mexico A. and M., Bowling Green, and Miami (Florida). (Languages and Literature)
- SELLERS, ASHLEY, (1941) S.J.D., Harvard. Attorney at Law. Taught at Emory and Georgia. (Public Administration)
- SELINSKY, HAROLD J., (1950) B.S., Georgetown. Systems Accountant, Accounting Systems Division, General Accounting Office. (Office Techniques)
- SERVESE, EDWIN H., (1951) B.S.C.E., Cooper Union. Cartographer, Hydrographic Office, Department of the Navy. (Technology)
- SETTE, F. J., (1941) M.S., Harvard. Deputy Director, Resources Division, Research and Development Board, Office of the Secretary of Defense. Taught at Norwich, Puerto Rico, and Virginia Polytechnic Institute. (Technology)
- SHARAR, EARL D., (1949) B.S., American. Management Assistant, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. (Office Techniques)
- SHAW, RALPH R., (1941) Ph.D., Chicago. Librarian, USDA. Taught at Columbia. (Languages and Literature)
- SHAW, WARREN C., (1951) Ph.D., Ohio State. Agronomist, Division of Weed Investigations, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at North Carolina State and Ohio State. (Biological Sciences)
- SIEGEL, IRVING H., (1949) Ph.D., Columbia. Co-Director, American Technology Study, Twentieth Century Fund. (Mathematics and Statistics)
- SIEGEL, JACOB S., (1949) M.A., Pennsylvania. Statistician, Population and Housing Division, Bureau of the Census, Department of Commerce. (Social Sciences)
- SEIGLER, E. H., (1948) Ph.D., Maryland. Senior Entomologist, Bureau of Entomology and Plant Quarantine, USDA. (Agricultural Research Center Committee)
- SILVERSTEIN, JULIUS, (1951) LL.B., Columbia. Chief Counsel, Claims and Site Acquisition Division, Office of General Counsel, General Services Administration. Taught at National Law School. (Public Administration)
- SIMMONS, LANSING G., (1952) B.S.C.E., Maryland. Chief Mathematician, Division of Geodesy, U. S. Coast and Geodetic Survey, Department of Commerce. (Technology)
- SIMMS, D. HARPER, (1952) B.J., Missouri. Chief, Information and Education Division, Soil Conservation Service, USDA. (Committee on Publications)
- SKOP, JACOB, (1951) Special Assistant to the Commanding Officer, Army Map Service, Department of the Army. (Technology)
- SLATER, C. S., (1950) M.S., North Dakota. Project Supervisor, Soils Division, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught at North Dakota and Yankton. (Physical Sciences)
- SMALL, NORMAN J., (1948) Ph.D., Johns Hopkins. Legal Analyst, Legislative Reference Service, Library of Congress. Taught at Johns Hopkins and Hunter. (Public Administration)



- SMITH, CHARLES W., JR., (1946) Ph.D., Wisconsin. Public Opinion Analyst, Department of State. Taught at Indiana, Rutgers, Alabama, and Kentucky. (Public Administration)
- SMITH, LOUIS C., (1949) S.J.D., National. Senior Attorney, Copyright Office, Library of Congress. Taught at National. (Public Administration)
- SMITH, STANCL M., (1950) B.S.C., Georgia. Chief, Division of Accounting and Audit, Office of Budget and Finance, USDA. (Public Administration)
- SMOOT, MARGARET M., (1952) Editor, Bureau of Agricultural and Industrial Chemistry, USDA. (Committee on Publications)
- SNYDER, F. F., (1949) B.C.E., Ohio State. Hydraulic Engineer, Corps of Engineers, Department of the Army. (Technology)
- SNYDER, JOSEPH M., (1947) B.S., Pennsylvania. Chief, Cartographic Division, Soil Conservation Service, USDA (retired). (Agricultural Research Center Committee)
- SNYDER, S. A., (1941) Director, Purchase and Stores Division, Federal Supply Service, General Services Administration. (Public Administration)
- SOLLINS, ALFRED D., (1951) M.A., George Washington. Mathematician, Coast and Geodetic Survey, Department of Commerce. Taught at George Washington. (Technology)
- SOUTHWORTH, H. M., (1945) A.B., Cornell. Agricultural Economist, Bureau of Agricultural Economics, USDA. (Social Sciences)
- SPANIER, DAVID H., (1950) M.P.L., National. Organization and Methods Examiner, Hospital Methods Improvement Branch, Office of the Surgeon General, Department of the Army. (Public Administration)
- SPENCER, FRANK H., (1949) Assistant Administrator, Agricultural Research Administration, USDA. (Public Administration)
- SPITZER, H. M., (1946) Dr. Juris, Vienna. Author and Lecturer. Formerly, Director, Research Institute of Economic Psychology, Vienna. (Social Sciences)
- STARKEY, JAMES H., (1950) B.S., Virginia Polytechnic. Administrative Officer, Office of Organization and Personnel Management, Agricultural Research Administration, USDA. (Committee on Correspondence Study and Extension Education)
- STATHIS, N. P., (1953) B.S., Massachusetts Institute of Technology. Chief of Military Bridging, Engineer Research and Development Division, Office, Chief of Engineers, Department of the Army. (Technology)
- STAUBER, B. RALPH, (1931) M.A., Minnesota. Head, Division of Agricultural Price Statistics, Bureau of Agricultural Economics, USDA. Taught at Minnesota. (Mathematics and Statistics)
- STEELE, J. GORDON, (1942) Ph.D., Ohio State. Head, Survey Analysis Section, Soil Conservation Service, USDA. (Physical Sciences)
- STEINBERG, JOSEPH, (1942) B.S., City College of the City of New York. Chief, Sampling Section, Population and Housing Division, Bureau of the Census, Department of Commerce. (Mathematics and Statistics)
- STEPHAN, FREDERICK F., (1946) M.A., Chicago. Director of the Study of Education, Princeton University. Taught at Pittsburgh and Cornell. (Mathematics and Statistics)
- STEPHENS, EDMUND, (1952) M.S., Oregon State. Assistant Chief, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. (Office Techniques)
- STEVENS, HENRY, (1946) Ph.D., George Washington. Head, Allergen Research Division, Bureau of Agricultural and Industrial Chemistry, USDA. (Physical Sciences)
- STINE, O. C., (1939) Ph.D., Wisconsin. Lecturer on Agricultural Economics, University of Florida; formerly Assistant Chief, Bureau of Agricultural Economics, USDA. Taught at Wisconsin and California. (Social Sciences)
- STOCKING, E. J., (1946) M.S., Iowa State. Assistant Chief, Washington Recruiting Branch, Examining and Placement Division, Civil Service Commission. Taught at South Dakota and Iowa State. (Technology)
- STONE, HAROLD A., (1946) M.S., Syracuse. Chief, Management Assistance Branch, Office of Comptroller, Department of the Army. Taught at Tulane. (Public Administration)
- SUPERVIA, G. MEDRANO DE, (1946) Licenciatura en Filosofía y Letras, Universidad de Valencia. Instructor, The Sidwell Friends School. Taught in the schools of Valencia, Spain, and the Dominican Republic. (Languages and Literature)
- SUPERVIA, RAFAEL, (1946) Licenciado en Derecho, Universidad de Valencia. Assistant Professor, George Washington University. Taught in Instituto-Escuela, Ciudad Trujillo, Dominican Republic. (Languages and Literature)
- SYKES, JOSEPH F., (1950) Ph.D., Toronto. Physiologist, Bureau of Dairy Industry, USDA. Taught at Michigan State. (Agricultural Research Center Committee)
- TARAKUS, EUCENIA, (1945) Russian gymnasium and University of Liege. Assistant Professor of Russian, Intelligence School, Department of the Navy. (Languages and Literature)
- TATUM, VIRGINIA G., (1952) A.B., Women's College, North Carolina. Information Specialist, Bureau of Animal Industry, USDA. (Languages and Literature)
- TAEUBER, CONRAD, (1953) Ph.D., Minnesota. Assistant Director, Bureau of the Census, Department of Commerce. (Social Sciences)
- TAYLOR, CARL C., (1937) Ph.D., Missouri. Consultant on Community Development, Foreign Agricultural Service, USDA. Taught at Texas, Missouri, North Carolina State, Brookings Institution, and Catholic. (Social Sciences)
- TAYLOR, NEVA I., (1951) A.B., George Washington. Washington Finance Office, U. S. Army. Taught at Strayer. (Office Techniques)

- TAYLOR, PERRY R., (1949) M.S., Massachusetts Institute of Technology. Assistant to the Chief of the Division of Water Pollution Control, Public Health Service, Department of Health, Education and Welfare. (Public Administration)
- TEPPER, MORRIS, (1952) Ph.D., Johns Hopkins. Meteorologist, Weather Bureau, Department of Commerce. Taught at Brooklyn. (Physical Sciences)
- TEUTON, FRANK L., (1952) B.S., Peabody College. Director of Information, Bureau of Agricultural and Industrial Chemistry, USDA. Taught at Memphis State Teachers College. (Committee on Information)
- TEWELES, SIDNEY, JR., (1952) M.S., Marquette, Certificate in Meteorology, Chicago. Research Meteorologist, Weather Bureau, Department of Commerce. Taught at Chicago and Central College. (Physical Sciences)
- TEWINKEL, G. C., (1946) M.C.E., Syracuse. Photogrammetric Engineer, Division of Photogrammetry, U. S. Coast and Geodetic Survey, Department of Commerce. Taught at George Washington and Maryland. (Technology)
- THACKREY, FRANKLIN, (1950) M.S., Kansas State. Director of Economic Information, Bureau of Agricultural Economics, USDA. (Languages and Literature)
- THIGPEN, JAMES E., (1951) B.S., Connecticut. Director, Tobacco Branch, Production and Marketing Administration, USDA. (Social Sciences)
- THOM, H. C. S., (1942) M.S., George Washington. Chief Climatologist, Weather Bureau, Department of Commerce. Taught at Iowa State and Maryland. (Physical Sciences)
- THOMAS, ALMON D., (1950) B.S.E.E., Colorado. Electrical Engineer, Bureau of Power, Federal Power Commission. (Technology)
- THURSTON, JOHN H., (1943) Ph.D., Harvard. Administrative Officer, Office of the Secretary, USDA. Taught at Northwestern. (Public Administration)
- TIERNEY, JOHN L., (1946) Ph.B., Loyola (New Orleans). Chief of Finance Division, Small Defense Plants Administration. Taught at St. Aloysius College (Vicksburg). (Office Techniques)
- TILLER, CARL W., (1946) M.A., Minnesota. Chief of Budget Methods, Office of Budget Review, Bureau of the Budget. (Public Administration)
- TOWNSEND, THOMAS T., (1952) A.B., Augustana. Head, Salary Administration Section, Division of Classification, Office of Personnel, USDA. (Public Administration)
- TRELOGAN, HARRY C., (1948) Ph.D., Minnesota. Assistant Research Administrator, Agricultural Research Administration, USDA. Taught at Minnesota. (Social Sciences)
- ULLMAN, MORRIS B., (1944) M.A., American. Statistician, Bureau of the Census, Department of Commerce. (Mathematics and Statistics)
- UTZ, E. J., (1949) B.S., Ohio State. Assistant Commissioner, Bureau of Indian Affairs, Department of the Interior. (Technology)
- VETTER, RICHARD C., (1952) M.S., Scripps Institution of Oceanography, University of California. Oceanographer, Office of Naval Research, Department of the Navy. Taught at California. (Physical Sciences)
- WADLEY, F. M., (1944) Ph.D., Minnesota. Formerly Statistical Consultant, Bureau of Entomology and Plant Quarantine, USDA. Taught at Minnesota. (Correspondence)
- WALL, NORMAN J., (1946) M.A., Minnesota. Head, Division of Agricultural Finance, Bureau of Agricultural Economics, USDA. (Social Sciences)
- WALLING, HERSCHEL C., (1946) C.P.A., M.B.A., Texas. Systems Accountant, General Accounting Office. Taught at Texas. (Public Administration)
- WALSH, ROBERT M., (1947) B.S., Boston. Deputy Assistant Administrator for Marketing, Agricultural Research Administration, USDA. (Social Sciences)
- WARD, KATHRYN P., (1945) Ph.D., George Washington. Associate Professor of English, University of Maryland. (Languages and Literature)
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- WASSERMAN, MAX J., (1934) Docteur des Sciences Economiques, Lyons. Economic Adviser for Intelligence Services, Office of International Trade, Department of Commerce. Taught at Illinois, Chicago, and Lyons. (Social Sciences)
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- WEBER, JOHN A., (1950) B.S.E.E., Cooper Union. Chief, Civilian, Marine Corps, Electronics Branch, Electronics Division, Bureau of Ships, Department of the Navy. Taught at University of Maryland. (Technology)
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- WEXLER, HARRY, (1939) D.Sc., Massachusetts Institute of Technology. Chief, Scientific Services Division, Weather Bureau, Department of Commerce. (Physical Sciences)
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- WILSON, M. L., (1938) D.Sc., Montana. Special Consultant on Extension Work, USDA. (Social Sciences)
- WILSON, MEREDITH C., (1925) B.S., Cornell. Chief, Division of Field Studies and Training, Extension Service, USDA. Taught at Wisconsin, Louisiana, Maryland, Purdue, Arkansas, Colorado A. and M. and Virginia Polytechnic. (Social Sciences)
- WINSLOW, JOSEPH E., (1946) Acting Executive Director, Civil Service Commission. (Public Administration)
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- WRIGHT, MARSHALL S., (1942) Assistant to the Director, Office of Plant and Operations, USDA (retired). (Technology)
- YOUMANS, E. GRANT, (1953) Ph.D., Michigan State College. Organization and Methods Examiner, Budget and Finance Division, USDA. Taught at Michigan State College. (Social Sciences)
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- ZIEG, HARRY E., (1952) Naval Architect, Contract Design Division, Bureau of Ships, Department of the Navy. (Technology)
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